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The Use of financial ratios in detecting fraudulent financial reporting: the case of companies listed on the Nairobi Securities Exchange

Morgan Otieno Ongoro
Strathmore Business School
Strathmore University

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**THE USE OF FINANCIAL RATIOS IN DETECTING
FRAUDULENT FINANCIAL REPORTING: THE CASE OF
COMPANIES LISTED ON THE NAIROBI SECURITIES
EXCHANGE**

MORGAN OTIENO ONGORO

**RESEARCH THESIS SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE
OF MASTER OF COMMERCE AT STRATHMORE
UNIVERSITY**

JUNE 2018

DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other university. To the best of my knowledge and belief, this thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

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Name : MORGAN OTIENO ONGORO

Signature :

Date :

Approval

The thesis of Morgan Otieno Ongoro was reviewed and approved by the following:

Dr. David Mathuva

Senior Lecturer, School of Management and Commerce,

Strathmore University

Prof. David Wang'ombe,

Dean, School of Management and Commerce,

Strathmore University

Prof. Ruth Kiraka

Dean, School of Graduate Studies,

Strathmore University

ABSTRACT

This study sought to investigate the use of financial ratios in detecting fraudulent financial reporting (FFR) among companies listed on the Nairobi Securities Exchange. This was done by determining whether selected financial ratios of fraudulent firms differed from those of non-fraudulent firms. Stepwise logistic regression was utilized in analyzing audited annual financial statements over a ten- year period, 2007 to 2016. The study adopted descriptive research design in analyzing findings from primary data. Categorization of firms as fraudulent was based on findings from the CMA annual reports on firms reported to have engaged in FFR between 2006 and 2017. 9 fraudulent firms were matched with 28 non-fraudulent firms on the basis of industry and financial year under consideration. 118 questionnaires were distributed to 37 listed companies representing 80% of the targeted population. Overall, profitability ratios, asset composition ratios, earnings quality ratios, management quality ratios and liquidity ratios were found to be significant in detecting FFR. This study highlighted the need for listed Kenyan companies to adopt efficient FFR detection and management techniques. The study also demonstrated the ability of financial ratios in detecting FFR. Findings from this study will help both internal and external auditors in improving on their effectiveness when it comes to detecting FFR. This study differentiated firms listed on the NSE that had engaged in FFR from those that had not engaged in FFR using financial ratios.

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ABBREVIATIONS AND ACRONYMS

ACFE	Association of Certified Fraud Examiners
CBK	Central Bank of Kenya
CMA	Capital Market Authority
CFO	Chief Finance Officer
FFR	Fraudulent Financial Reporting
FFS	Fraudulent Financial Statements
FFT	Fraud Triangle Theory
GAAP	General Accepted Accounting Principles
ICPAK	Institute of Certified Public Accountants of Kenya
IFRS	International Financial Reporting Standards
IAS	International Accounting Standards
NSE	Nairobi Securities Exchange
ROA	Return on Assets
ROE	Return on Equity
SACCO	Savings and Credit Co-operative societies
SAS	Statement on Auditing Standards
PAT	Positive Accounting Theory

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CHAPTER ONE: INTRODUCTION OF THE STUDY

1.1 Background of the study

This chapter discussed the background of the study in terms of understanding: accounting fraud, prevalence of fraudulent financial reporting (FFR) and financial information on FFR. It also outlined: the problem statement, objectives, significance of the study, scope and limitations of the study. This study sought to determine the significance of using financial ratios in detecting FFR among companies listed on the NSE. For decades, users of financial reports have relied on published financial statements for decision making presupposing that the preparation of these reports in strict compliance with existing accounting legislations automatically translates into quality reporting (Silverstone & Sheetz, 2007). This discourse has however come under sharp criticism with critics questioning the integrity of financial reporting especially in the wake of fraudulent financial reporting. Consequently, a need for finding ways of detecting and preventing FFR has arisen among policy makers and key stakeholders with the use of financial ratios being prioritized.

Fraud generally falls into three categories; asset misappropriation, corruption and fraudulent reporting. Asset misappropriation happens to be the most prevalent yet the least costly form of fraud. It occurs when there is theft and misuse of company assets through schemes like; fraudulent disbursements, off-book skimming, cash larceny, lapping of account receivable payments and unauthorized use of fixed assets. Corruption happens to be advanced through: conflict of interest, bribery, illegal gratuities and economic extortion. In terms of frequency of occurrence and cost implications, corruption comes in second and third respectively after asset misappropriation and fraudulent financial reporting (ACFE, 2010).

Fraudulent financial reporting (FFR) refers to the intentional misrepresentation or omission of financial facts which when relied upon by a victim might lead to loss/disenfranchisement (Albrecht, Albrecht, & Albrecht, 2006). FFR occurs when financial reports are prepared through manipulation and falsification of books of accounts. Schemes used in FFR include but are not limited to; overstating revenues, assets and profits; understating losses, expenses, and liabilities; improper financial disclosures and improper asset valuation (Omar, Johari, & Smith, 2017). Among the three forms of fraud, FFR has the lowest frequency of occurrence yet the highest cost implication. FFR anchors itself on intentional deceit and concealment with; falsification of

documents, collusion between managers and employees, accounting anomalies and forgery topping the list (Hogan, Rezaee, Riley, & Velury, 2008).

Despite not being a new area of study, research on FFR has yielded conflicting findings with no consensus among FFR researchers on the usefulness of financial ratios in detecting FFR. Some researchers have concluded to the affirmative, some have dissented whereas others have neither affirmed nor dissented depending on the methodology that they adopted. Researchers who used logistic regression (Liou & Yang, 2008) affirmed the significance of financial ratios when it came to detecting FFR whereas those who used discriminant analysis (Kaminski, Sterling Wetzel, & Guan, 2004) concluded that financial ratios had limited ability in detecting FFR. Differences in findings could also be attributed to the geographical area of study with researchers from Asian Pacific and other developing regions affirming the significance of financial ratios in detecting FFR whereas some researchers in western countries attested to the limited ability of financial ratios in detecting FFR (Zainudin & Hashim, 2016).

The targeted population of firms in this study was drawn from the Nairobi Securities Exchange given its readily available secondary data in the form of published annual financial statements. The adoption of the CMA's annual report on performance and regulatory violations by listed firms also informed the decision to settle on firms listed on the NSE. This later on formed the basis for categorizing firms as either fraudulent or non-fraudulent.

1.1.1 Prevalence of Fraudulent Financial Reporting

FFR has gained global notoriety for its catastrophic impact on world economies with firms losing approximately 5% of their annual revenues through accounting fraud (ACFE, 2016). The study of FFR has attracted a lot of attention among scholars and regulators. On the global scale, FFR practices have been more rampant in developed economies as compared to developing economies. This has in hindsight led to more studies on detection of FFR being carried out in developed countries. Even though FFR happens to have the least frequency of occurrence, recent studies have shown that FFR has the highest cost implication when compared to other forms of fraud. FFR has been gradually increasing globally from less than 5% in 2010 to 10% in 2016 (ACFE, 2016).

The Association of Certified Fraud Examiners (ACFE) in their report on occupational fraud and abuse estimated 10% of all global white collar fraud in 2016 to have been linked to fraudulent financial reporting (ACFE, 2016). Within the same breath, Surveys done in 2004 by PWC Kenya

found out that the number of Kenyan respondents who reported asset misappropriation stood at 77%, those who reported accounting fraud stood at 38% whereas those who reported corruption stood at 27%. The survey attributed occurrence of accounting fraud to inadequate governance structures among organizations (PWC, 2004).

Surveys done by EY in 2016 found majority of employees working in finance departments ready to justify engaging in FFR so as to meet their quarterly targets or safeguard the economic survival of their firms. This according to the report was as a result of inadequate controls and general failure in financial reporting practices. In Sub-Saharan Africa, asset misappropriation accounted for 85% of all occupational fraud cases in 2016 with a median loss of USD 100,000. Corruption accounted for 48.4 % of all occupational fraud with a median loss of USD 150,000 where as FFR accounted for 5.6% of all occupational fraud with a median loss of USD 581,000 (ACFE, 2016). Just like the global report on Fraud, it is evident that Sub-Saharan Africa has not been left out on FFR related issues. Losses linked to FFR have been gradually increasing on the global scale as shown in Table 1.1 and Table 1.2 below.

Table 1.1 Frequency of occurrence of fraud categories-global context

Year	Asset misappropriation	Corruption	Fraudulent Financial Reporting
2010	90%	31%	Less than 5%
2012	87%	33%	8%
2014	85%	37%	9%
2016	83%	35.4%	10%

Source (ACFE report on nations, 2016)

Table 1.2 Median Loss of fraud categories- global context

Year	Asset misappropriation	Corruption	Fraudulent Reporting	Financial
2010	\$ 135,000	\$ 250,000	\$ 4 million	
2012	\$ 120,000	\$ 250,000	\$ 1million	
2014	\$ 130,000	\$ 200,000	\$ 1million	
2016	\$ 125,000	\$ 200,000	\$ 975,000	

Source (ACFE report on nations, 2016)

1.1.2 Qualitative and quantitative financial information on FFR

Financial ratios form the basis for quantitative financial information. Different ratios have different interpretations with different purposes thus making their adoptions industry specific. Financial ratios play a big role in management accounting and investment decisions. Firms use them for gauging their performance whereas investors use them for decision making. Studies done on detection of FFR have heavily leaned towards the use of quantitative financial information (Ratio analysis) with the only study done in Kenya focusing on detection of FFR in SACCOs (Larry, 2009). Given the high number of available ratios, most study have adopted the use of ratio categories in their work with the following categories being common among FFR researcher; profitability ratios, liquidity ratios, capital adequacy ratios, asset quality ratios, management quality ratios and leverage ratios.

The understandability, relevance, reliability and comparability aspects of financial reports form the core of qualitative characteristics of financial information. Unlike quantitative financial information which happens to be absolute, qualitative financial information are relative in nature. Qualitative information might be derived from both the language used in financial reports and other risk factors like; managerial abnormalities (aggressive style of management), personnel abnormalities (lifestyle change) and business process abnormalities like overlooking internal controls (Christie & Zimmennan, 1994). Most studies on FFR have overlooked the qualitative bit of FFR related financial factors as a result of difficulties in obtaining fraud information from firms which most often than not conceal such kind of information.

Fraud symptoms picked up from both qualitative and quantitative financial information do not occur in isolation despite the fact that only a small portion might be visible during the actual occurrence of fraud. However much users of financial statements try to identify post facto fraud symptoms, the mere presence of such symptoms might not necessarily infer fraud hence the need for qualitative information to compliment quantitative information on fraud (Goel, Gangolly, Faerman, & Uzuner, 2010). Most organizations tend to perform ratio analysis by keenly examining relationships that exist among accounting variables. Ratio analysis takes either a time series or cross sectional approach. Starting with the former, time series ratio analysis examines and compares organizational performance across a given time duration. The later compares organizational performance with benchmarked performance across specific industry (Colbert, 1994).

1.1.3 Nairobi Securities Exchange

Formed in 1954 as an association of volunteer stock brokers, the NSE boasts of being the most active and developed bourse in East and Central Africa. It provides a platform for trading shares and for listing companies under stringent regulatory requirements. As of December 2016, 68 companies had been listed under 11 major sectors which included; Agricultural sector, Automobiles & Accessories, Banking, Energy & Petroleum, Insurance, Investment, Investment services, Manufacturing & Allied, Commercial & Services, Telecommunication & Technology and Real Estate Investment Trust (CMA, 2016).

NSE is regulated by the Capital Market Authority of Kenya (CMA) whose key mandate is licensing and regulating the capital market by approving the listing of securities on the NSE and other public offers. In line with its regulatory role, CMA has adopted in its annual reports the publication of a list of companies under investigation and those whose licenses have been suspended as a result of non-compliance and financial misappropriation. So far, 6 firms have been delisted from the NSE with the latest firms under suspension being Baumann and Hutchings Biemer (Victor, 2017).

1.2 Problem Statement

Financial reporting has for a long time played an important role in providing relevant information for decision making. Despite its criticality and usefulness, questions have been raised with regards to the accuracy of published financial statements by Kenya companies. FFR has crept into various sectors of the Kenyan economy with a retailer being accused of manipulating its books of accounts to the tune of KES 1 billion (Guguyu, 2015). This has raised legitimate concern as to the effectiveness of existing FFR detection tools thus bringing into the fore the need for research on financial ratios that might be significant in detecting FFR and in differentiating FFR firms from non FFR firms. The impact of FFR has been far reaching with various stakeholders being either directly or indirectly affected. Stakeholders who are at pains with regards to FFR include; auditors, business owners, employees, investors, creditors and pensioners (Zainudin & Hashim, 2016). The revelation of overt FFR practices by firms has not only led to the investigation of affected external auditors (Olingo, 2017) but has also led to loss of jobs for employees and loss of business for suppliers (Ihucha, Busulwa, & Esiara, 2015). The Kenyan financial sector has also recorded an increase in FFR incidences with 2 listed banks being placed under receivership and 1 being liquidated. The manufacturing industry has not been left out either when it comes to FFR with one company losing approximately KES 879 million as a result of pre-invoicing middlemen in order to meet its performance target (Mugambi, 2015). Given that all these firms implicated in FFR were issued with unqualified audit opinions by their auditors, who happen to be big four audit firms, there is a genuine concern as to the effectiveness of analytical procedures currently being used by auditors and the effectiveness of FFR detection tools adopted by various firms.

Prevalence of FFR by Kenyan companies has been attributed to failure in corporate governance and weak internal controls. The inability of auditors to flag off FFR has heightened the need for research on how to profile FFR firms. Since 2015, 6 listed companies have been delisted, 2 banks have been placed under statutory management and 1 bank has been liquidated (Mugambi, 2015). As a result, foreign investors have started pulling out of the Kenyan market with a South African Company selling its stake in a local manufacturer after being forced to bear losses to the tune of KES 312 million attributed to FFR by its Kenyan affiliate (Juma, 2015)

The above negative effects of FFR in Kenya point to the need for research on how to detect and prevent future reoccurrence of FFR. Despite the dire consequences of FFR, only one empirical

study on detection of FFR among SACCOs in Kenya has been done. There has not been consensus on the usefulness of financial ratios in detecting FFR with some researchers finding them to be significant, other finding them not significant whereas others have neither affirmed nor denied their significance when it comes to detecting FFR. Findings from this study will help in mitigating social problems attributed to FFR among Kenyan firms by helping policy makers in formulating preventative, detective and corrective anti-FFR controls. This study will also help in filling up the academic gap that exists on FFR in Kenya by expanding the scope of study from SACCOs to listed companies.

1.3 Research Objectives

1.3.1 Main Objective

The overall objective of this study is to assess the usefulness of financial ratios in detecting fraudulent financial reporting among companies listed on the Nairobi Securities Exchange.

1.3.2 Specific Objectives

1. To determine financial ratios that can be used in differentiating companies implicated in fraudulent financial reporting from those not implicated in fraudulent financial reporting.
2. To determine fraudulent financial reporting management techniques used by companies listed on the Nairobi Securities Exchange.

1.4 Research Questions

1. Which financial ratios are significant in differentiating listed companies implicated in fraudulent financial reporting from those not implicated in fraudulent financial reporting?
2. What fraudulent financial reporting management techniques are being used by companies listed on the Nairobi Securities Exchange?

1.5 Significance of the Study

Below is a discussion of how this study will be helpful to various stakeholders;

1.5.1 Auditors

Findings on ratios that are significant in detecting FFR will go a long way into helping both external and internal auditors in identifying financial ratios that are prone to manipulation and falsification. These risk variables will then be used by auditors in creating risk profiles for their

clients prior to any audit engagement hence developing efficient audit procedures and avoiding potential litigation related to their professional obligation of providing independent audit opinions on the accuracy of published reports.

1.5.2 Regulatory authorities

Findings on significant FFR detection ratios and FFR management techniques used by Kenyan companies will help ICPAK and CMA in regulating the accounting profession in Kenya by setting anti-FFR guidelines and policies to be adopted by Kenyan companies. The study will also help ICPAK in formulating analytical procedures to be used for investigating fraudulent financial reporting and in training its members on how to detect and prevent potential FFR practices.

1.5.3 Researchers

Given the limited literature on the use of financial ratios in detecting FFR by Kenyan companies, this study will provide a basis upon which other researchers and academicians intending to carry out similar research on fraudulent financial reporting in Kenya might rely on. By suggesting the likely FFR management techniques used by companies listed in the NSE, this study will highlight areas where further research on FFR detection and management might be needed.

1.5.4 Shareholders and Business owners

This study will be helpful to business owners and shareholders when it comes to formulating; preventative, detective and corrective controls against fraudulent financial reporting and in making rational investment decisions.

1.6 Scope of the study

The targeted population for this study was 37 companies listed on the NSE as at December 2016. These companies represent 8 sectors of the NSE. Ratio analysis on annual audited financial statements belonging to the 37 companies were conducted with the financial year under consideration starting from 2007 to 2016 (10 years). Firms were categorized as fraudulent based on; CMA annual reports on companies implicated with fraud and firms with qualified audit opinions. This was in line with criteria adopted by Chen & Elder (2007); Spathis (2002); Persons (1995); (Kaminski et al., 2004) and Suyanto (2009). This study examined; profitability ratios, asset composition ratios, capital adequacy ratios, leverage ratios, liquidity ratios, management quality ratios and earnings quality ratios in relation to FFR.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

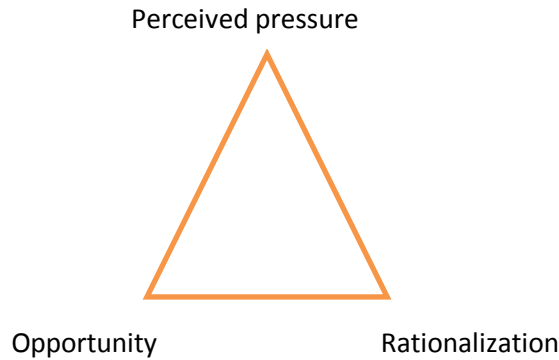
This chapter reviewed relevant literature related to fraudulent financial reporting. The chapter also critiqued previous related studies done by other scholars in a bid to identify existing research gaps that needed to be addressed. A review and analysis of theories relating financial ratio analysis and fraudulent financial reporting was done. Ensuing thereafter was the analysis of all relevant variables under consideration in the study in line with variables adopted by researchers who specialized in the field of fraudulent financial reporting. This was followed by the analysis of the study's conceptual framework. The guiding yardstick for this chapter was research objectives as outlined in Chapter one.

2.2 Theoretical literature review on the use of ratios in detecting FFR

This study adopted the Fraud Triangle Theory (FTT) in discussing objective one. The 3 pillars of FTT guided the researcher in selecting and formulating both the independent and dependent variables. The adoption of FTT was in line with Studies done by; Suyanto (2009); Smith, Wright, & Skousen (2009); Lou & Wang (2011); Amara, Amar, & Jarboui (2013) Omar et al. (2017); Huang, Tsaih, & Lin (2012); Hasnan et al.(2014); Lari (2009); Chen & Elder (2007); Persons (1995); Kirkos, Spathis, & Manolopoulos (2007) and Nia (2015) all of which used FTT in explaining ratios likely to be considered as significant when it comes to detecting FFR.

2.2.1 Fraud Triangle Theory

Cressey (1953) pioneered the development of Fraud Triangle Theory while studying the behavior of inmates incarcerated as a result of alleged financial trust violation. The Fraud Triangle theory hypothesizes fraud as a function of pressure, opportunity and rationalization. People tend to engage in fraud when faced with pressure of some sort, when they feel that they can commit fraud without getting caught and when there is a way to justify their actions (Murphy & Free, 2016). These 3 pillars of FTT can also act as Fraud drivers as shown in the figure 2.1 below.



Source (Cressey,1953)

Figure 2.1 Fraud drivers

2.2.1.1 Pressure

Perceived pressure stands at the apex of the list of reasons as to why firms engage in fraud. Spathis (2002) posits that firms are more likely to understate their expenses and overstate their revenues when they report low profits than when they report high profits. Persons(1995) opines that organizations with high profits are less likely to record financial misstatements as a result of financial error than organizations with low profits. Unfavorable social, economic and political conditions tend to form the fodder for manipulations of financial statements with the pressing desire to fulfill financial needs making individuals to engage in fraud. On the part of institutions, the need to stand out among peer companies, attract positive brand image and avoid confrontation with owners might motivate them to engage in FFR (Premuroso & Jones, 2012).

The likelihood of companies engaging in FFR increases when their; profitability is low, gearing level is high, liquid ratios are low, earning power is low and operational cost of management are high (Persons 1995). Albrecht et al., (2006) categorizes pressure into; vice pressure, financial pressure, work related pressure and others. This study will adopt the use of proxy variables for pressure as advanced by; Persons (1995), Kaminski et al. (2004), Spathis, (2002), Suyanto (2009) and Chen & Elder (2007). These proxies have been categorized into; Profitability ratios, asset composition ratios, leverage ratios, liquidity ratios, earning power ratios and management quality ratios.

2.2.1.2 Opportunity

Albrecht et al., (2006) describes opportunity, the second pillar of fraud, as the conduit between pressure and fraud. In studying this pillar, Chen & Elder (2007) posits that even though firms might be facing pressure to engage in FFR, they still need to be convinced that they cannot be caught. The opportunity to commit fraud might arise from; lack of internal control, inability to measure performance, lack of punishment against fraudster, ignorance, lack of audit trail and lack of information (Albrecht et al.,2006). In line with previous studies by Suyanto (2009) and Chen & Elder (2007), this study used the following proxy variables for opportunity; related party transaction, effectiveness of internal controls and complex financial arrangements. Young (2005) states that a number of cases touching on earnings management have something to do with related party transaction as was with Enron's case hence the higher the number of opportunities the higher the likelihood of FFR.

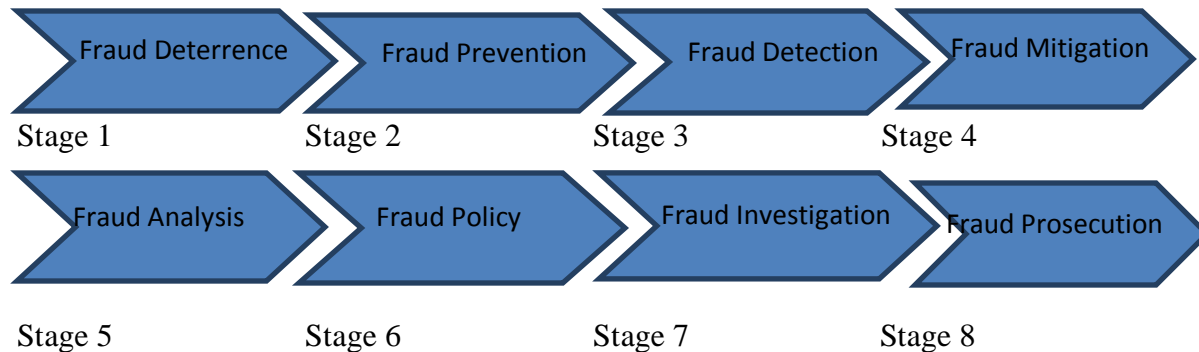
2.2.1.3 Rationalization

Rationalization forms the last piece of the fraud triangle puzzle where the perpetrator tries to hang on to reasons that justify his/her actions. Cressey (1953) posits that the main reason as to why individuals may try to rationalize fraud is when they believe that their actions are non-criminal or that the impact of their action is minimal in comparison to the global financial position of their organizations.

Many scholars have found it difficult when it comes to measuring rationalization given that it is highly subjective and difficult to attribute a value to (Ramos,2003 & Brazel et al.,2007). Studies that looked at this pillar adopted the use of proxy variables. In line with studies done by Suyanto (2009) and Chen & Elder (2007), this study considered the following as proxies for rationalization; frequency of changes in auditors and frequency of financial restatements. Firms with high frequency of changes in auditors and high frequencies of financial restatements have a high likelihood of practicing FFR. Predominance in financial statement restatement indicates low financial reporting quality hence increasing the likelihood of FFR. Sorenson et al. (1983) suggests that most changes in auditors are occasioned by the need by organizations to lower audit cost and to reduce chances of FFR detections.

2.2.2 Fraud management lifecycle theory

This study adopted the use of Fraud management lifecycle theory (FMLT) in discussing the second objective which dealt with FFR management techniques used by listed companies. Developed by Wilhelm (2004), this theory depicts fraud management as a network lifecycle of activities whose aim is to facilitate sequential and simultaneous actions aimed at containing the risk of fraud occurring. This theory outlines eight stages through which fraud can be managed as shown in Figure 2.2 below. Stage one of the FMLT is deterrence of fraud. This stage involves activities aimed at discouraging stakeholders from attempting to commit fraud (Wilhelm, 2004). In the context of FFR, deterrence might be through generation of users report on non-compliance with anti-FFR policies (ACFE, 2014). Prevention, the second stage of FMLT, encompasses activities that prevent fraud from occurring. In the context of this study, prevention of FFR might be through strict internal controls targeting authorization for posting and reversing journals in the accounting system (Kastantin, 2005). The third stage of fraud management happens to be detection where activities aimed at uncovering fraud are implemented. FFR detections might involve activities such as; document examination, analysis of financial relationships and audit engagements (Spathis, 2002). Stage four of the FMLT is on mitigation where processes are put in place to contain losses attributed to fraud by restricting accounting system accesses for affected personnel. Stage five involves analyzing inherent losses which occur even after the preceding stages are in place. Stage six involves setting up a fraud policy. Stage seven involves investigations and finally stage eight involves prosecution of perpetrators.



Source (Wilhelm, 2004)

Figure 2.2 Fraud management lifecycle theory

2.2.1.4 Summary of the relevance of adopted theories to the study

The Fraud Triangle Theory brings out the motivation/driving force for engaging in fraud. As earlier on discussed, people engage in fraud as a result of; pressure, opportunity or rationalization. This theory helped in answering objective one of the study by discussing the relationship between financial ratios linked to the three pillars of FTT and FFR. These ratios were then tested to determine whether they were significant when it came to detecting FFR. The theory also helped in answering objective two by discussing the likely motives behind firms engaging in fraud which then informed the adoption of FFR management techniques aimed at reducing pressure, opportunity and rationalization. The Fraud Management Lifecycle Theory helped in answering objective 2 which sought to understand FFR management techniques adopted by listed companies. As discussed in the theory, adoption of activities targeting the eight stages might prove to be helpful in not only determining which ratios are significant in deterring and detecting FFR but also in selecting effective tools for managing FFR. This study therefore adapted the use of FTT and FMLT since the two theories amicably related to the research objectives and given that previous FFR researchers have used them.

2.2.3 Fraudulent financial reporting techniques

FFR has for a long time been practiced under the guise of creative accounting. FFR mostly targets four major pillars of financial reporting. These pillars include: expenses, revenues, liabilities and assets. An overstatement of assets and revenues overstates the firm's profits and its bottom line whereas an overstatement of expenses and liabilities understates the firm's profits and its bottom line (Premuroso & Jones, 2012).

Fraudulent financial reporting takes different angles depending on different case scenarios. Currently, there are diverse ways through which FFR may be practiced. These techniques include but are not limited to; Cookie-jar accounting (Burgstahler & Dichev, 1997), playing around with provisions and accruals for loan losses (Saurina Salas, Perez, & Salas-Fumás, 2006), understatement/overstatement of assets, liabilities, revenues, and expenses (Spathis, 2002b), changes in depreciation policy and unsuitable financial disclosures depicted as notes in financial statements (Lin, Hwang, & Becker, 2003).

Cookie Jar accounting refers to the practice of understating revenues during successful accounting periods in order to offset any imminent losses expected to be incurred during unsuccessful periods.

Organizations engaging in this practice tend to create discretionary expenses when their bottom line and profits are favorable as was with WorldCom which was accused of increasing expense provisions in its current financial year in a bid to increase earnings in its subsequent financial year (Ward, 2012).

Different sets of financial reports used for decision making and policy formulation might be subjected to fraudulent financial reporting practices. The quality of earnings of any company is most often than not hinged on its cash flow statements given that accruals can be determined from the difference between operating income and net profit (Kastantin, 2005). Misstatements of assets and liabilities have a direct impact on the statement of financial position whereas misstatement of revenues and expenses directly affects the firm's statement of financial performance. This therefore reiterates the fact that financial statements are pre-disposed to manipulation and misrepresentation by preparers who most often than not happen to be managers (Burgstahler & Dichev, 1997).

2.3 Empirical Literature Review

2.3.1 The use of ratios in detecting fraudulent financial reporting

Most studies on detection of fraudulent financial reporting using financial ratio have adopted multiple factor studies with FFR researchers studying the significance of more than one financial ratio in detecting FFR. Within the parameters of FFR, there have been a number of methodologies that have been adopted by researchers in this field. These methodologies include; Discriminant Analysis, Logistic Regression, Bayesian Networks, Artificial Neural Networks, Decision trees and Probit regression (Kirkos, Spathis, & Manolopoulos, 2007; Kotsiantis, Koumanakos, Tzelepis, & Tampakas, 2006; Liou, 2008).

Persons (1995) in his study of using financial statement data in identifying factors associated with fraudulent financial reporting based on stepwise-logistic regression matched 103 fraudulent firms with 100 non fraudulent firm between 1970 to 1990. His determination of non-fraudulent firms was based on a list of similar COMPUSTAT firms found within similar industries through the analysis of ten variables 8 being financial ratio. Persons developed two predictive models one for the year of fraud while the other one for the subsequent year. The study found out; firm size, capital turnover, financial leverage and asset composition to be significantly associated with FFR. The model was able to accurately identify fraudulent firms with minimal cases of misclassification on

non-fraud firms. The challenge with this study was that a small fraction of fraud was detected on non-fraud firms hence limiting the capability of its model in predicting FFR.

Beasley et al., (2000) in their study of fraudulent financial reporting among US public companies used logistic regression model where they matched 77 fraudulent firms with 305 non-fraudulent firms. Using risk factors such as management attitude toward FFR, weak internal controls, ownership status and growth rate, they found that most fraudulent firms; were relatively small in size, had been experiencing net losses, had weak internal controls and were barely break-evening in years preceding the fraud year. The period under consideration for their study was between 1987 and 1997. The two major shortcomings for this study included: data sources used were incomplete hence hampering accessibility to relevant data and the logistic regression model used was not effective in categorizing firms as fraudulent or non- fraudulent compared to simple decision aids.

Spathis (2002) in his study on false financial statement in Greece affirmed the significance of financial ratios in detecting FFR. Using logistic regression, he matched 38 fraud companies with 38 non-fraud companies listed in Athens Stock Exchange while excluding financial companies. His basis for classifying companies as fraudulent were; adverse audit opinions, tax non-compliance, negative net worth, suspension in the stock exchange as a result of falsification of financial information and litigations against the company with regards to FFS. The study concluded that logistic regression model had an accuracy of 84% when it came to predicting fraud and that fraud majorly occurred in assets, inventory, leverage and sales. The major shortcoming for this research was exclusion of financial institutions.

Kirkos et al.,(2007) in their study on data mining techniques for the detection of FFS, compared discriminant and logarithm analysis using multi criteria decision aids and UTADIS classification method. Following a jackknife approach, they concluded that financial ratios obtained from published financial statements significantly detected FFR. The major shortcoming of their study was that their findings could not be generalized on small companies or those that were privately owned.

Chen & Elder (2007) while studying association between fraud risk factors and FFR established that proxies for pressure, opportunity and rationalization were significant in detecting fraudulent financial reporting. Their study adopted logistic regression methodology where both univariate and multivariate tests were done on 97 fraudulent firms and 467 non fraudulent firms. The basis

for classification was on frequency of financial restatements, qualified audit opinions and Taiwan Economic Journal database of financial restatements. Proxies for pressure were; analyst forecast errors, negative cash flow from operations and percentage of directors and shareholdings pledged for credits and loans. Proxies for opportunity included; related party transactions, CEO duality and control-ownership wedge. Proxies for rationalization included; quarterly earnings restatement, frequency of internal auditors and external auditor changes. Their study established a significant positive correlation between all the proxies and FFR.

Nigrini & Miller (2007) in their study of using Benford's Law in detecting fraudulent financial reporting based on numerical digits distributions within normal datasets affirmed the significance of applying Benford's law in detecting FFR. The major shortcoming of the study however was the lack of a clear distinction between accounting errors and accounting fraud.

Bai, Yen and Yang (2008) in their study of FFS among listed companies in China used Classification and Regression tree (CART) in predicting the impact of FFR. The study analyzed 24 FFS and 124 non-FFS reports and developed 2 FFS detection models; one with industry benchmark and the other without industry benchmark. Integrating the logistic regression model, the study concluded that CART models are more accurate in categorizing fraudulent and non-fraudulent firms. The major short coming of this study was lack of theory related to fraudulent financial reporting.

Lari (2009) in his study of the power of financial ratios in detecting FFR in SACCOs within Kenya using stepwise logistic regression model found financial ratios to be significant in detecting fraudulent financial reporting. Using a sample of 46 SACCOs, 23 of them being fraudulent, he established that member's shares and deposit returns, gross loans to members/total assets and members deposit/total assets forms the primary ratios that predict FFR in SACCOs. Other ratio that he found to have been significant in predicting FFR included Net profit/Total Asset ratio, Total Operating expenses/ Average total Assets and growth in members' loan rate. This study was the only FFR related study done in Kenya and focused on SACCOS. The major shortcoming for this study was that sample for FFR firms was limited to reported cases by auditors and regulators.

Hasnan et al.,(2014) in their study of determinants of FFR in Malaysia, analyzed factors involved with FFR (predisposition, motive & opportunity) and relationship between earnings management and FFR. Their study looked at financial statements between 1996 and 2007 and matched 53

fraudulent firms with 53 non-fraudulent firms. They concluded that the likelihood of FFR was high among firms with; high related party transaction, high percentage of founders as board members and high number of prior violation cases. The study also found out that firms with high levels of financial distress, poor corporate governance structures and adverse audit opinion tend to engage more in FFR. The study did not however look at significance of financial ratios in detecting FFR.

Suyanto(2009) in identifying fraud risk factors and developing a prediction model for FFR based on SAS 99, adopted logistic regression methodology. He analyzed 143 firms and concluded that fraud risk proxies for pressure (Net profit/Total assets) and opportunity (Inventory/Total assets, Big 4 audit firms and related party transactions) were significant in detecting FFR. On the contrary, proxies for rationalization were not significant in detecting FFR. The major shortcoming of this study was the lack of financial ratio proxies for rationalization hence the adoption of dummy variables in its place.

Kaminski et al. (2004) in answering the question as to whether financial ratios can detect FFR, used discriminant analysis in studying 21 financial ratios for 79 fraudulent firms and 79 non-fraudulent firms based on firm size, time period and industry. Incorporating univariate analysis, the study showed that within a 7year time period (+/- fraud year), 16 out of 21 ratios were significant. Furthermore, out of the 16 significant ratios only 3 ratios were significant for 3-time period with 5 being significant prior to the year of fraud. The study concluded that financial ratios had limited ability in detecting FFR. The major shortcoming of this study was that there was a high rate of misclassifications of firms as fraudulent or non-fraudulent. The misclassification stood at between 58% and 98%.

2.4 Conceptual Framework

The conceptual framework of this study explained the relationship between the independent variables, dependent variable and control variable. In this case, the dependent variable was fraudulent financial reporting, the independent variables included proxy variables for; profitability ratios, liquidity ratios, earning qualities ratios, management quality ratios and asset composition ratios while the control variable was firm size measured by log of total assets. This was in line with the two objectives adopted by the study.

2.4.1 Operationalization of Key Variables in the study

2.4.1.1 Profitability Ratios

In accordance with the Fraud Triangle theory, organizations geared towards profit maximization and sustainable revenue generation most often than not find themselves under immense financial pressure to post positive results and outperform their peers (Altman, 1968). Profitability ratios are continuous variables which measure the efficiency of a firm in utilizing available resources for revenue generation. Most organizations heavily rely on profitability as a yard stick for their financial performance with investors being more attracted to organizations which consistently report profits unlike to those which report losses (Albrecht et al., 2006).

The tendencies by managers to overstate their firm's revenue during tough economic times and when performance is below expectation/projections has been linked to their desire to influence investor behavior and business decisions (Njogu ,2016; (Beasley, Carcello, Hermanson, & Lapides, 2000b); Persons ,1995; Chen & Elder 2007). Gaver, Gaver, & Austin (1995) argues that managers with existing bonus schemes pegged on their firm's financial performance in most occasions engage in fraudulent financial reporting practices meant to increase earnings and profits in the short term in a bid to earn more revenue. Healy & Wahlen (1999) on the other hand argue that some managers might be motivated to understate their revenues in situations where they do not comply with minimum requirements.

In line with studies by Chen & Elder (2007) and Suyanto (2009), this study adopted the following ratios as proxies for profitability; Operating Income/Total Assets, Cost of sales/sales, Related party sales/Total sales, Net Income/Total Assets, Operating Cost/ revenue, Sales/Total Assets, Net profit/Sales and Gross profit/Total Assets. As discussed above, profitability plays a key role in evaluating financial performance and by and large in providing pressure for engaging in Fraudulent financial reporting.

2.4.1.2 Capital Adequacy Ratios

Capital adequacy refers to the availability of financial resources in the form of capital that are at the disposal of a firm and which might be used for investment or lending. Zaheer (2016) defines Capital adequacy as a continuous variable that measures the proportion of capital and securities which can be said to be valuable and adequate in insulating a firm against financial risk attributed

to changing socio-political and economic variables. Capital adequacy is critical in evaluating the financial prospects of a firm in that it gives an indication as to whether the firm will be able to absorb unexpected market shocks like operational and credit risks while at the same time be able to operate as a going concern (Athanasoglou et al. 2005). For this study, the following proxies were used as measures of capital adequacy; Total Equity/Total Assets and Retained Earnings/Total Assets. Listed companies with inadequate capital are more likely to face financial pressure from their investors and regulators hence they are more prone to practicing FFR. This is because adequate capital increases investor confidence while at the same time it promotes stability in the financial sector (Bhatt, 2012).

2.4.1.3 Asset Composition Ratios

These ratios depict the credit risk associated with; investments, loan advances, real estates, fixed, current & off-balance sheet transactions, that are in the possession of a firm (Zaheer, 2016). These ratios help firms in determining the level and scope of credit risk that assets as well as other off-balance sheet transactions are pre-disposed to. In measuring the asset quality of a firm, it is important to consider the sufficiency of a firm's assets in covering expected losses (Ongore & Kusa, 2013).

Variables used in measuring asset composition include; change in property, plant and Equipment in relation to change in Total assets, change in receivables compared change in revenue, Current Assets/ Total Assets, Inventory/Total assets. Inventory/Current Assets and Receivables/Total assets (Bhatt, 2012). The lower the proportion of current assets in a firm's portfolio of assets compared to its fixed assets, the higher the likelihood of the firm engaging in FFR. Changes in receivables should be positively correlated with changes in sales/revenue hence firms with negative correlation between receivables and sales are most likely to engage in FFR (Kastantin, 2005). Bertay, Kunt, & Huizinga (2013) posit that asset quality ratios can be used in predicting bankruptcy of firms where companies with high proportions of bad debt or non-performing loans to total loans being more likely to fall into the bankruptcy trap as a result of bad credit decision making. This therefore means that such firms are more likely to engage in fraudulent financial reporting as a result of increased credit risk.

2.3.1.4 Management Quality Ratios

The performance of a firm largely depends on the quality of its managerial practices. A skillful and professional management team will most likely help their firms in realizing set out objectives like cost minimization and improving operational efficiencies (Ongore & Kusa, 2013). Organizations have recently adopted performance based contract for their managers outlining what is expected of them when it comes to profit and shareholder wealth maximization.

High quality managerial practices increases productivity, decreases costs and improves organizational profitability. This therefore leads to the assumption that firms with unfavorable management quality ratios are more likely to engage in fraudulent financial reporting with the intention of presenting favorable reports. The proxy ratios to be considered under this parameter will be total cost/total income, total asset growth, earnings growth, sales growth, operating cost/total assets, change in Revenue/Sales compared to change in Working Capital and operating costs/Revenue. For organizational resources to be deployed efficiently and for income to be maximized, there is need for efficiency in managerial performance. Rahman et al. (2009) and Sangmi and Nazir (2010) argue that operating profits to total income ratio can be best used in measuring income generation capacity and management efficiency with higher profitability reflecting quality in managerial practices.

2.4.1.5 Earnings Power Ratios

This ratio measures the ability of a firm to generate revenue and profit by effectively and efficiently utilizing its capital and assets. Earnings in this context include operational income generated from both traditional and non-traditional sources of income. Specific ratios used in measuring earning power quality include; return on equity, return on Assets, Accruals, Free cash flows/cash flow from operating activities and Total Income/ Total assets.

Return on Equity ratio measures the efficiency with which shareholders' wealth is used in generating profits for the firm. The higher the ratio, the more profitable a company is and by extension the higher the return that shareholders get back from their investment. This therefore reduces the financial pressure on firms to engage in Fraudulent Financial reporting (Athanasoglou, Brissimis, & Delis, 2008).

Return on Assets ratio measures the efficiency with which company assets are used in generating profits thus the higher the Return on Assets, the higher the profitability of a firm and the lower the likelihood of engaging in Fraudulent Financial Reporting (Bourke, 1989).

To determine the quality of earnings of a particular firm, one needs to analysis the proportion of accruals that is included in net profits. Accruals are derived by finding the difference between net profits and cash flows from operational. The larger the difference between Net income and cash flow from operations, the higher the likelihood of engaging in Fraudulent Financial Reporting as was with the case of Enron (Kastantin, 2005). Listed companies with strong earnings power have the capability of operating as a going concern hence these companies can cover their bad debt losses, invest more in viable ventures, distribute dividends to shareholders and increase their capital adequacy.

Free cash flows depict the amount of residual cash flow at the disposal of a firm and which can be used by managers (Khan, Kaleem, & Nazir, 2012). Free cash flows are determined by finding the difference between cash flows from operating activities and cash flows from investing activities. The higher the value of free cash flow, the higher the Earning Quality of the firm and the lower the likelihood of a firm engaging in Fraudulent Financial Reporting (Noor, Sanusia, Heang, Iskandar, & Isa, 2015).

Given the importance of profitability in running organization, the need to generate more earnings and revenue might push firms into engaging in fraudulent financial reporting. This would therefore mean that listed companies with low ROA and ROE are more likely to engage in FFR and vice versa. Other financial ratios that can be used in detecting the earning power of a firm include but are not limited to; Interest Income to Total Income, Dividend payout ratio, operating profits/Average Working Fund, Net profit/Average Assets, Interest income/Total Income and other income to Total Income.

2.4.1.6 Liquidity Ratios

These ratios measure the going concern of firm by gauging the ability of a firm to meet its obligations as and when they fall due. Dang (2011) posits that there is a positive relationship between a firms' profitability and its liquidity position given the availability of funds to invest and settle other obligations. Based on the above discussion, it can be said that firms with strained liquidity positions are more likely to undergo financial distress and might be tempted to engage in

Fraudulent Financial Reporting. This study adopted the following proxies in measuring the liquidity position of firms; Current ratios (Current Assets/Current Liabilities), Quick ratios (Current Assets-Inventory/Current Liabilities) and Working capital/Total assets.

2.4.1.7 Leverage Ratios

Leverage refers to the level of debt financing in a firm's capital structure. For a firm to operate in a profitable and efficiency manner, it needs to have an optimum capital structure which balances debt and equity financing (Dechow et al., 1996). It has been argued by many that debt financing tends to be cheaper compared to equity financing reason being the incorporation of tax shield in debt financing and non-dilution of ownership and control among many other reasons advanced through the Net Income approach of capital structure. The flip side of taking the above arguments at face value is that organizations which exclusively use debt finance might in the long run be faced with insurmountable task of refinancing their loan hence increasing their default risk (Chen & Elder, 2007). High level of debt leads to high interest rates which results from readjustment of lending rate to factor in the risk of default.

The issue of debt financing in relation to fraudulent financial reporting has however not been conclusive and consistent among scholars in the field of earnings management and Fraudulent Financial reporting. On one hand, scholars basing their argument in line with positive accounting theory under the debt hypothesis, argue that organizations with high interest cost resulting from high debt levels tend to adopt accounting policies that recognize future revenues in their current financials in a bid to post positive results to their shareholders and debt holders (Bell et al., 1993; (Spathis, 2002a); (Albrecht et al., 2006); (Kaminski et al., 2004); (Altman, 1968).

On the other hand, Jensen (1986) argues that debt financing reduces the opportunistic behavior of managers to engage in earnings management. Christie & Zimmennan (1994) in their study established a negative relationship between earnings manipulation and managerial opportunism hence asserting that the reduced opportunity alluded by Jensen (1986) might lead to reduced risk of Fraudulent Financial reporting. Studies done by (Dechow, Hutton, Kim, & Sloan, 2012) established that firms with low leverage ratios tend to have high accruals and vice versa given the high interest of debt holders on debt refinancing rather than general accounting information.

Due to the above mentioned inconsistencies, this study adopted the view that firms with high leverage ratios are more likely to engage in Fraudulent Financial reporting by overstating revenues

so as to neutralize high refinancing costs. This study adopted the use of the following proxies for leverage ratios; Total Debt/Total Equity, Total Liabilities/Total Assets, change in Equity compared to change in Debt, change in short term debt compared to change in long term debt and Total Debt/Total Equity.

2.4.1.8 Opportunities

As earlier on discussed, this refers to the belief by fraud perpetrator that they won't be caught since prevailing circumstances provide a cover up for their maneuvers (Lou & Wang, 2011b). This study adopted; strength of internal controls, percentage of sales to related party transactions and equity investment ratios (complex financial arrangement) as proxies for opportunity. Firms with weak internal controls will be assigned 1 and 0 if otherwise. As was with the case of Enron, most companies with complex transactions and numerous related party transactions are more likely to engage in FFR than their counterparts (Bratton, 2002; Swartz and Watkins, 2003; Deakin and Konzelmann, 2004).

2.4.1.9 Rationalization

This refers to the tendency of fraud perpetrators to justify their actions. This variable takes a dichotomous structure with firms being assigned 1 where there is presence of rationalization and 0 if otherwise. Even though it is difficult to observe and measure Rationalization with respect to FFR, this study adopted frequency of changes in auditors and frequency of financial restatements as proxies for Rationalization. Firms with high frequency of financial restatements are more likely to engage in FFR than those with low or no financial restatements (Lou & Wang, 2011b). The frequency of changes in auditors depicts bad relationship and mistrust between managers and auditors hence the higher the frequency of change in auditors the more the likelihood of firms to engage in FFR. The frequency of changes in auditors might also depict a desire by management to reduce the likelihood of auditors in detecting FFR (Sorenson et al., 1983 & Krishnan and Krishnan, 1997).

2.4.1.10 Fraudulent Financial Reporting Status

This variable acts as the dependent variable of the study. It takes a dichotomous structure in so far as there is a mutually exclusive relationship between occurrence and non-occurrence of FFR. Firms that are reported to have engaged in FFR are coded with 1 whereas those reported not to

have engaged in FFR are coded with 0. These coding thereafter forms the basis for conducting a binary logistic regression (Liou, 2008).

2.5 Summary of the Literature

The study adopted Fraud triangle theory and Fraud management cycle theory by discussing FFR under the pillars of pressure, opportunity and rationalization and detection of FFR under the eight steps of managing fraud. These theories helped in the formulation of conceptual framework where by independent variables were identified. The identified variables were then operationalized through the use of proxy variables. Empirical literature review was thereafter done on previous studies that looked at the use of financial ratios in detecting FFR. This was done in line with the objectives and problem statement of the study. The empirical and theoretical review revealed the need to fill up FFR research gaps in Kenya.

2.6 Research Gaps

From the empirical and literature review discussed above, there has been conflicting findings on the significance of using financial ratios in detecting FFR. Some researchers have found financial ratios to be significant, others found them not significant while others have neither affirmed nor denied their significance when it comes to detecting FFR. It is imperative to note that the lack of consensus on the usefulness of financial ratios in detecting fraudulent financial reporting can be attributed to: adoption of different research methodologies, stepwise logistic regression and linear discriminant analysis, and focus on different regions with different accounting regimes, Europe represented by Greece, Asia represented by China and North America represented by the USA.

By using logistic regression; Bell and Carcello (2000), Spathis (2002), Persons (1995), Beasley (1996), Bell and Carcello (2000), Spathis, Doumpos, and Zopounidis (2002), Suyanto (2009), Lari (2009) and Chen & Elder (2007) found financial ratios to be significant in detecting FFR. Kaminski et al. (2004) on the other hand arrived at the conclusion that financial ratios have limited ability of detecting FFR by using Discriminant Analysis. There has only been one study on FFR in Kenya which looked at the power of ratios in detecting FFR among Kenyan SACCOs. This study sought to expand the scope of the previous FFR research from SACCOs to companies listed on the NSE. Unlike most previous studies which overlooked primary data, this study will triangulate both findings from secondary and primary data.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter discussed the following in relation to the research question and objective; philosophical assumption, research design, target population, data collection, data analysis, validity of research instrument and reliability of research instrument. The study triangulated findings from both primary and secondary data collected in the course of the study. Significance of ratio analysis in detecting fraudulent financial reporting was explored using stepwise regression analysis.

3.2 Research Philosophy

This study adopted a pragmatic philosophical approach which lays more emphasis on outcome, gives the researcher freedom to choose his/her preferred methodology and allows for many approaches of data analysis and problem solving (Creswell, 1994). The emphasis on understanding the research problem was squarely within this study which sought to answer the question as to whether financial ratios might be used in detecting fraudulent financial reporting among companies listed on the NSE. The pragmatic approach has however not escaped criticism with critics insisting that research should follow a precedence of known socio-political and economic events. This criticism does not however water down the merits of pragmatic research approach hence the decision to adopt this approach.

3.3 Research design

This study adopted descriptive research design because it involves the investigation of financial ratios which might be used in detecting fraudulent financial reporting. Descriptive research design allowed the researcher to obtain financial information on FFR and explain the association between specific ratios and the likelihood of FFR occurrence. Analysis was done on collected data to determine whether significant differences existed between the mean of specific financial ratios of companies implicated with fraud from those not implicated with fraud. 43 financial ratios derived from published financial statements were analyzed over a 10-year period. (Spathis, 2002a), Kaminski et al., (2004) and Persons (1995) also used descriptive analysis in their study on detecting FFR using financial ratios.

Firms were categorized as fraudulent and non-fraudulent based on findings from the CMA annual report between 2006 and 2017 on firms accused to have engaged in FFR and on the analysis of key financial relationships between sales, cost of sale and receivables. 9 fraudulent firms were matched with 28 non-fraudulent firms based on the financial year under consideration, industry and asset size. This was in accordance with studies done by (Lou & Wang, 2011b) Persons (1995) and (Spathis, 2002b).

3.3.1 Categorization of firms as fraudulent or non-fraudulent

In line with the desire to detect FFR and differentiate FFR firms from non FFR firms, there is need for clear criteria on classification of firms. Below are some of the criteria that might be used in classifying firms as fraudulent:

Analyzing financial relationship between assets and liabilities: A trend analysis of a firm's statement of financial position indicating a sudden unexplained but significant change in the assets versus liability structure of a firm might be seen as a red flag for FFR since it could mean understatement or overstatement of assets or liabilities with an increase in the ratio meaning both short term and long term liabilities are being understated or are not declared in the statement of financial position (ACFE, 2009).

Analyzing sales against cost of sales and sales against account receivables: For a firm to make any sale, it has to incur a cost, be it cost of manufacturing or purchasing raw materials, hence cost of sales ought to be positively correlated with sales. Firms with negative correlation between sales and cost of sales are most likely to practice FFR since this will be contrary to accounting logic on relationship between sales and cost of sales. It is also generally expected that sales and account receivables need to be directly proportional thus firms with an indirect proportionality between sales and account receivables are most likely to be categorized as fraudulent (ACFE, 2009).

Analysis of unexpected fluctuations in profit margins; Unexpected but significant changes in the profit margins that a firm report might be used as an indicator of FFR given that firms forecast their margins in line with budgets and therefore their margins should stay stable and consistent with the firms' budget. This therefore means firms reporting high volatility in their profit margins are more likely to be classified as fraudulent (ACFE, 2009).

In addition to the above criteria, previous researchers have used other measures in classifying firms as fraudulent. Spathis (2002) based his classification on: auditor's opinion on published financial

reports, investigative reports by tax authorities, stock exchange report on firms accused of FFR and existing court cases. Kaminski et al., (2004) based their categorization of firms on SEC's report issued between 1982 and 1999. Zainudin & Hashim (2016) also based their classifications on report on firms accused of FFR. In line with the above criteria, this study relied on both the analysis of financial relationships and CMA's report between 2006 and 2017 on firms accused of FFR. Table 3.1 below shows the categorization of firms based on the above criteria.

Table 3.1 Categorization of firms

	FFR Firms	Non FFR Firms	Total Number
Agriculture	2	3	5
Automobile & Accessories	0	2	2
Commercial & Service	3	6	9
Construction & Allied	1	4	5
Energy & Petroleum	1	3	4
Investment Sector	1	3	4
Telecommunication	0	1	1
Manufacturing & Allied	1	6	7
External Auditors	0	0	0
Total	9	28	37

Note: FFR and Non FFR firms denote fraudulent financial reporting and Non fraudulent financial reporting firms respectively.

3.4 Target population

The target study population for this research was 37 companies listed on the NSE as of December 2016. Just like previous studies which excluded banks from their target population, this study also excluded financial institutions given missing key variables like cost of sales and inventory. Listed firms which had not been listed by 2007 were also excluded from the target population considering the fact that the study involved analysis of variables from 2007-2016. Maddala (1991) argues that the only effect of sample size in a logistic regression model is on the constant term and not the coefficient of the independent variables. Target respondents included; external audit managers, Internal auditor managers, senior financial accountants and management accountants. Listed companies were chosen, categorized and matched based on firm size, industry and time period as advanced by Kaminski et al., (2004).

3.5 Data collection Instruments

This study used both primary and secondary data. Secondary data acted as the main source of data for the study. Primary data was used to corroborate secondary data by answering objectives two which dealt with FFR managerial techniques adopted by listed companies against FFR. The study adopted a semi-structured questionnaire which was administered to external auditors, internal auditors, management accountants and senior accountants. The questionnaire was adopted from the work of Yücel (2013), Moyes (2011) and the ACFE report on nations Sub-Saharan Edition of 2016 with modification aligned towards meeting the main objective of the study. Closed ended questions based on a Likert scale were adopted with an allowance of an open ended question at the end to give room for additional comments from the respondents. Questions to be included in the questionnaire were precise and in sequential format.

The first part of the questionnaire looked at the general information, part two looked at the FFR detection tools adopted by listed firms, part three looked at FFR risk assessment and management attitude toward FFR whereas part 4 looked at techniques used in FFR and establishing a profile for firms likely to engage in FFR perpetrators.

3.6 Data collection procedures

Secondary data in the form of audited annual financial statements were obtained from the Capital Market Authority library and from websites of companies which form part of the target group. The financial period under consideration was from 2007 to 2016. This 10-year time frame was adopted since fraud does not only occur during the year of discovery, rather it builds up from at least 3 years before the year of fraud (Kaminski et al., 2004). In order to understand tools used by industry players in managing FFR and other control weaknesses, 118 questionnaires were self-administered to the target respondents. Financial accountants and management accountants were chosen as targeted respondents because of their direct role in preparation and presentation of financial reports. The experience of internal auditors in auditing compliance with institutional policy was also factored in selecting them as part of the targeted respondents.

Based on the above discussion, the research triangulated findings from both primary and secondary sources in line with the work of Njogu (2016) and Mathuva (2010). Triangulation was adopted based on the fact that no single method can adequately solve a research problem hence the need to

use more than one method in data collection and analysis (Ngulube, 2005). Triangulation has also been the most predominant research method adopted by related researchers.

3.7 Data analysis and measurement

Data collected from both Primary and secondary data were first checked for errors, outliers, normality, linearity, multicollinearity and homoscedasticity before being analyzed further. Normality of data was tested using the Kolmogorov-Smirnov and Shapiro-Wilk test where significance value greater than 0.05 depicted that the data was normally distributed. Homoscedasticity was tested using Test Glejser with the null hypothesis of no presence of homoscedasticity being accepted when the P-value was greater than 0.05 and otherwise. Linearity of data was tested using scatter plots and Deviation from Linearity test. Financial ratios were also analyzed using other descriptive statistics such as Mean, Medium, Maximum, Minimum and standard deviation.

Analysis of secondary data was done through stepwise logistic regression. The regression tested significance of variables in differentiating fraudulent firms from non-fraudulent based on the null hypothesis of no significant differences between the two groups. Variables found to have been significant at alpha 0.10 using the forward selection criterion were first retained and further regressed using logistic regression with a total of 332 observations being factored. Logistic regression was adopted given the dichotomous nature of the dependent variable which was occurrence or non-occurrence of FFR (Zainudin & Hashim, 2016). The final set of significant variables was generated from the results of the logistic regression model after multiple iterations. The criteria for adopting the final set of significant variables was variables found to have a significant value less than 0.05.

Analysis of primary data was done using descriptive statistics with the use of mean and percentages being adopted. Correlation Analysis was also done to establish the relationship between retained significant variables and FFR status. Variance Inflation factor and tolerance value were used in testing for multicollinearity between the adopted independent variables. Sekaran et al. (2010) and Neter et al. 1990) pointed out that tolerance value of 0.1 and a variance inflation factor of 10 is acceptable when conducting quantitative research. P-value and T-value/Wilcoxon signed-rank test helped in establishing the significance of the independent variables in the study.

Stepwise logistic regression was adopted due to the following reasons; it helps in analyzing binary dependent variables and it is also the most applied regression model in the field of FFR (Spathis, 2002a), (Kaminski et al., 2004). Table 3.2 below shows the operationalization of variables considered when conducting stepwise logistic regression.

Table 3.2 Operationalization of variables

Variables	Formula	Symbol	Acronym
Profitability	Cost of sales/Sales	<i>COS_S</i>	<i>PROF1</i>
	Related party sales/Total sales	<i>RPT</i>	<i>PROF2</i>
Asset composition	Inventory/Current Assets	<i>I_CA</i>	<i>AC1</i>
	PPE/Total Assets	<i>PPE_TA</i>	<i>AC2</i>
	Log of total assets	<i>SIZE</i>	<i>AC3</i>
	Receivables/Total Assets	<i>R_TA</i>	<i>AC4</i>
Earnings Quality	Free cash flows/Cash from operating activities	<i>FCF</i>	<i>EQ</i>
Management Quality	Operating cost/Total Assets	<i>OC_TA</i>	<i>MQ</i>
Liquidity	Working Capital/Total Assets	<i>WC_TA</i>	<i>LIQ</i>
FFR status	FFR=1, non FFR= 0	<i>FFR</i>	<i>FFRS</i>

The regression model used in this study was as shown below;

$$FFR = b_0 + b_1(PROF1) + b_2(PROF2) + b_3(AC1) + b_4(AC2) + b_5(AC3) + b_6(AC4) + b_7(EQ) + b_8(MQ) + b_9(LIQ)$$

Where:

FFR = Dummy variable where 1 represents fraudulent firm while 0 represents non-fraudulent firm

PROF1 = Cost of sales/Sales

PROF2 = Related party sales/Total Sales

AC1 = Inventory/Current Assets

AC2 = PPE/Total Assets

AC3 = Log of Total Assets

AC4 = Receivables/Total Assets

EQ = Free cash flows/Cash flow from operating activities

MQ = Operating cost/Total Assets

LIQ = Working capital/Total Assets

3.8 Validity and Reliability of Research Instrument

Validity in research refers to the ability of a research instrument to measure what it is supposed to measure and capturing what it is supposed to capture. To address the validity of research instruments, this study adopted the use of questionnaires as formulated and used by Moyes (2011) ,Yücel (2013) and ACFE (2016). These questionnaires were tested and used in other studies on accounting fraud. This study also relied on audited annual financial statements in addition to consultations with experienced researchers. Data from financial reports was checked for completeness and thereafter coded.

Reliability in research refers to the ability of a research instrument to generate consistent results especially when other researchers use similar methodology (Sharma, 1989). This study adopted the use of convenience sampling where a pilot study was done using adopted questionnaires. The study came up with precise and simple questions to be used in the pilot study in a bid to enhance reliability of information that was to be collected.

The reliability of primary data was subjected to triangulation where by findings from questionnaires (primary data) were compared with results from audited financial statements (Secondary data). This was in line with studies done by Cohen et al., 2000 and Golafshani (2003).

3.9 Ethical considerations

Given the sensitivity of this study, the researcher prioritized; confidentiality, privacy and integrity in the course of this study. Consent was obtained from targeted participants through consent forms in accordance with studies by Lari (2009) and Njogu (2016) . In line with the concept of confidentiality, this study upheld anonymity by not publishing names of listed companies categorized as either fraudulent or non-fraudulent. Rather, listed companies were identified with coded alphabetical names.

CHAPTER FOUR: PRESENTATION OF FINDINGS

4.1 Introduction

This study sought to look at prediction of fraudulent financial reporting using financial ratios. This chapter discussed findings from analyzed annual audited financial reports of companies listed in the Nairobi Securities Exchange. Secondary data was collected from the CMA library and from specific company websites. Primary data took the form of questionnaires which were administered to management Accountant, internal auditors, external auditors and financial analysts. Research findings were discussed under the following headlines; descriptive results, response rate, demographic characteristics, diagnostic tests and inferential statistics on findings from secondary data.

4.2 Descriptive Statistics

This section discusses the descriptive statistics for both dependent and independent variables for specific industries as categorized by the NSE.

4.2.1 Descriptive Statistics on significant variables

Table 4.1 depicts the summary of results on descriptive analysis of the variables under study. These variables included: Free cash flows, cost of sales/sales, inventory/current assets, operating cost/total assets, property plant & equipment/total assets, receivables/total assets, related party transactions, size and working capital/total assets. Overall findings showed that the average rate of free cash flow for listed companies stood at 5.7%. This meant that on average, listed firms reported slightly higher cash flows from operating activities as compared to cash flows from investment activities. When it came to the proportion of cost of sales in relation to sales, listed companies on average reported an average rate of 62.3% implying that most firms on average ended up reporting relatively low margins.

The proportion of inventory on current assets stood at an average of 31.3% whereas the average rate of property, plant and equipment on Total assets stood at 35.9%. The proportion of receivables/Total assets stood at an average of 19.2%. Inventory and current assets were considered given that their valuation is highly subjective and depends on estimates and discretion of management hence leaving them predisposed to manipulation (Persons, 1995). The average proportion of related party stood at 52% with relatively high variations from one company to

another as depicted by the standard deviation value of 1.973. Related party transactions are highly susceptible to manipulation especially in the wake of intercompany transfer pricing issues. The average working capital/Total Assets ratio stood at 12% depicting the average liquidity level of listed companies.

Table 4.1 Summary Descriptive Statistics on Quantitative variables

	Observations	Mean	Median	Std. Dev.	Minimum	Maximum
FCF	332	0.057	0.648	8.805	-97.069	99.866
COS_S	332	0.623	0.703	0.279	0.000	1.554
I_CA	332	0.311	0.280	0.222	0.000	1.218
OC_TA	332	0.198	0.142	0.165	0.002	1.082
PPE_TA	332	0.359	0.284	0.252	0.000	1.658
R_TA	332	0.192	0.158	0.145	0.003	0.886
RPT	332	0.520	0.030	1.973	0.000	17.932
SIZE	332	6.224	6.500	1.675	0.000	8.577
WC_TA	332	0.120	0.129	0.344	-4.136	0.833

Note: Std.Dev denotes standard deviation, FCF denotes free cash flows, COS_S denotes cost of sales/Sales, I_CA denotes Inventory/Current Assets, OC_TA denotes Operating cost/Total Assets, PPE_TA denotes Property plant & Equipment/Total Assets, R_TA denotes receivables/Total Assets, RPT denotes Related party transactions and WC_TA denotes working capital/Total Assets

Table 4.2 below shows the result of descriptive statistics of firms categorized as fraudulent firms. As can be seen, fraudulent firms on average had negative free cash flows meaning their cash flows from investing activities were more than their cash flows from operating activities, they had a relatively higher cost of sales/sales as compared to the average for listed firms, they had higher operating cost/total assets, higher PPE/total assets, lower receivables/total assets, higher related party transactions, smaller size and lower working capital/total assets when compared to the average for listed firms. This as depicted in Table 4.2 shows that on average, FFR firms had low liquidity ratios, low profitability ratios, low earnings quality ratios, low management quality ratios, low inventory/current assets and low receivables/total assets.

Table 4.2 Summary Descriptive Statistics on Fraudulent firms

	Observations	Mean	Median	Std. Dev.	Minimum	Maximum
FCF	71	-1.354	0.423	7.918	-62.234	2.462
COS_S	71	0.789	0.717	0.228	0.441	1.554
I_CA	71	0.278	0.257	0.192	0.001	0.883
OC_TA	71	0.218	0.130	0.202	0.039	1.032
PPE_TA	71	0.495	0.617	0.261	0.000	0.865
R_TA	71	0.134	0.108	0.096	0.019	0.543
RPT	71	1.541	0.054	3.881	0.000	17.932
SIZE	71	6.098	6.420	1.982	0.000	8.534
WC_TA	71	-0.027	0.055	0.562	-4.136	0.833

Note: Std.Dev denotes standard deviation, FCF denotes free cash flows, COS_S denotes cost of sales/Sales, I_CA denotes Inventory/Current Assets, OC_TA denotes Operating cost/Total Assets, PPE_TA denotes Property plant & Equipment/Total Assets, R_TA denotes receivables/Total Assets, RPT denotes Related party transactions and WC_TA denotes working capital/Total Assets

4.2.2 Response Rate

This study excluded four Sectors namely; Banking Sector, Insurance Sector, Investment Service, Real Estate Investment Trust due to missing financial statements for some of the years under study and missing key variables like Cost of sales and Inventory especially under the financial sector. Real Estate Investment Trust sector was excluded because of missing financial statements given that it had been listed in the Bourse in 2015. The Investment Service sector was excluded given that it only had one firm. Banking and Insurance sectors were excluded because of lack of key variables like cost of sales, Inventory and Quick ratios. Financial statements acted as the main source of secondary data and were collected from a total of 37 listed firms representing 80% of companies in 8 sectors under study. These financial reports were collected over a period of 10 years from 2007-2016 with a total of 332 observations being recorded. Primary data was used to corroborate secondary data through the administration of questionnaires. Out of the 118 questionnaires that were issued, 66 questionnaires were returned with 3 having incomplete information thus accounting for 53.39% response rate. A response rate of between 30% and 40% is adequate for analysis according to Saunders, Lewis and Thornhill (2007) and Sekaran (2003). Table 4.3 below depicts the response rate per industry from collected questionnaires.

Table 4.3 Response rate per Industry

	Firms		Questionnaires	
	N	%	N	%
Agriculture	5	14%	9	14%
Automobile & Accessories	2	5%	3	5%
Commercial & Service	9	24%	11	18%
Construction & Allied	5	14%	5	8%
Energy & Petroleum	4	11%	6	10%
Investment Sector	4	11%	4	6%
Telecommunication	1	3%	2	3%
Manufacturing & Allied	7	19%	14	22%
External Auditors	0	0%	9	14%
Total	37	100%	63	100%

Note: N denotes total number

4.2.3 Demographic Characteristics

Table 4.4 below shows the demographic characteristics of respondents in terms of the position that they held in their respective organizations, years of their experience and their respective industry category. 42% of the respondents were management accountant, 28% were internal auditors, 16% were external auditors, 12% were financial accountants and only 2% were chief financial officer. This finding showed that majority of the respondents were auditors and management accountant who are directly involved in preparing financial statements and in auditing existing financial reporting practices hence improving the reliability of the responses. On years of experience, 48% of all respondent had worked for their organizations for a period of 6-10 years, 36% of the respondents had worked for 1-5 years, 12% had worked for 11-15 years and 4% of the respondents had worked between 16-20 years. This therefore shows that majority of the respondent had work experience of more than 5 years adequate enough to understand the reporting structure of their firms and other challenges facing their line of work. On industry category, majority of the respondent came from the Manufacturing and allied sector with the percentage of respondents from this sector standing at 22%. 18% of the respondents were from the Commercial and Service Sector, 14% from External Auditors, 14% from the Agricultural sector, 10% from Energy and

Petroleum, 8% from Construction and Allied Sector, 6% from Investment sector, 5% from Automobile and Accessories sector and 3% from Telecommunication sector. The percentage of response rate per industry was in line with the weight of the industry representation for the targeted sectors making industries with more firms to record more response rate than those with few numbers of firms.

Table 4.4 Demographic characteristics

Position held in organization		Industry category	
Management Accountant	42%	Manufacturing and Allied	22%
Internal auditors	28%	Commercial and Service Sector	18%
External Auditor	16%	External Auditors	14%
Financial Accountant	12%	Agricultural sector	14%
Chief Finance Officer	2%	Energy and Petroleum	10%
Yrs of experience		Construction and Allied	8%
6-10 years	48%	Investment sector	6%
1-5 years	36%	Automobile and Accessories	5%
11-15 years	12%	Telecommunication	3%
16-20 years	4%		

4.2.3.4 FFR Management techniques adopted by listed firms

Table 4.5 below depicts FFR management techniques used by listed companies in detecting FFR. It was revealed that 47% of the respondents chose external audit as their first detection tools against FFR. 11 % chose internal audit as their preferred choice for detecting FFR, 10% chose document reviews, 8% chose ratio analysis, 7% chose managerial reviews and 5% chose independent audit committees as their preferred detection tools. This finding suggested that most listed firms relied on audit functions as their preferred tools for detecting FFR with an aggregate of 58% and external audit process topping the list. It was also revealed that despite most respondents acknowledging that they were conversant with FFR detection tools, only 5% thought that Fraud Training for managers and employees was effective in complimenting both external and internal audit. Of paramount importance was the adoption of document reviews at 10% and Managerial reviews. With only 8% of the respondents using financial ratios in detecting FFR, this study will assist in building on the knowledge of FFR detections tools for listed firms.

Table 4.5 FFR management techniques adopted by listed firms

	N	
	Valid	% of Adoption
External Audit processes	63	47%
Internal Audit processes	63	11%
Management Reviews	63	7%
Independent Audit Committee	63	5%
Fraud Training for Manager and Employees	63	5%
Document Examination	63	10%
Formal Fraud Risk Assessment	63	4%
Dedicated Fraud department	63	3%
Ratio Analysis	63	8%

Note: N denotes number

4.2.3.5 Financial ratios used in detecting FFR

Respondents were asked to rate a set of ratios in terms of their effectiveness in detecting FFR. Table 4.6 below show that 21% of the respondents rated changes in provisions as their most preferred ratio when it came to detecting FFR, 19% of the respondents rated Liquidity ratios as effective, 16% rated Leverage ratios as effective, 12% rated relationship between sales and cost of sales, 8% rated Profitability ratios whereas the remaining variables had ratings of between 3% and 6%.

Table 4.6 Effectiveness of specific financial ratios used in detecting FFR

	N	
	Valid	Missing
Profitability ratios	63	8%
Leverage ratios	63	16%
Liquidity Ratios	63	19%
Change in Receivables/Change in Revenue	63	5%
Change in Inventory/Change in sales	63	3%
Change in Sales/ Change in Cost of Sales	63	12%
Return on Asset	63	5%
Return on Equity	63	5%
Percentage change in Provisions	63	21%
Capital Adequacy Ratios	63	6%

Note: N denotes number

4.2.4.6 FFR risk assessment and management attitude

Respondents were asked to rate their firms in terms of risk assessment and management attitude towards FFR detection. On scheduling FFR risk assessment, 36% of the respondents said their organizations rarely schedules FFR risk assessment, 56% said their organizations occasionally schedules FFR risk assessment whereas only 8% said their organizations frequently schedules FFR risk assessment. On Inclusion of Internal and External factors in FFR assessment, 68% said their firms frequently factors in both external and internal, 20% said their firms always factors in both Internal and external whereas 12% said their firms occasionally factors in internal and external factors in their assessment. On assessment of FFR by management, 60% said their management occasionally assesses FFR whereas 20% said their management frequently assessed FFR. On involvement of internal audit in FFR reporting, 60% said internal auditors were always involved whereas 40% said internal auditors were frequently involved. Table 4.7 below shows that the general attitude of management when it comes to detecting FFR is not as stringent as it ought to be.

Table 4.7 Management attitude towards FFR

	<i>Never</i>	<i>Rarely</i>	<i>Occasionally</i>	<i>Frequently</i>	<i>Always</i>
Regular schedules for FFR risk assessment	0%	36%	56%	8%	0%
Inclusion of Internal and External factors	0%	0%	12%	68%	20%
Assessment of FFR by management	0%	12%	60%	20%	8%
Involvement of Internal Audit in reporting	0%	0%	0%	40%	60%

4.2.4.7 Techniques for perpetrating FFR

Respondents were asked to rate the most likely means that a perpetrator might use in fraud concealment schemes. 38% of the respondents chose creating fraudulent transaction in the accounting systems as the most likely means through which FFR can be perpetrated. 33% thought Altering transactions in the accounting system was the most prevalent form of FFR, 16% thought that creating Fraudulent physical documents was the most prevalent form whereas 13% thought altering physical documents was the most prevalent form through which FFR can be perpetrated in their organizations. This as depicted in table 4.8 shows that most incidences of FFR are likely to occur more in accounting systems than in physical document like receipts hence the importance of authorization before any entry is posted in financial systems.

Table 4.8 FFR techniques

		Creating Fraudulent Physical Document	Altering Transactions in the accounting System	Altering Physical documents	Creating Fraudulent Transactions in the accounting systems
N	Valid	63	63	63	63
	Missing	0	0	0	0
Mean		16%	33%	13%	38%

Note; N denotes number

4.2.4.8 Internal control weaknesses that might lead to FFR

Respondents were asked to rate the internal control weaknesses that they consider relevant in increasing FFR opportunities. On lack of employee fraud education, 80% said it could highly create an opportunity for engaging in FFR, 16% thought it mostly contributes to FFR whereas 4% thought it somewhat contributed to FFR. On lack of independent checks/Audit; 68% said it could extremely create an opportunity for engaging in FFR whereas 32% thought it was a high contributor of FFR opportunity. On lack of competent personnel in oversight role; 80% said it could extremely create an opportunity for engaging in FFR whereas 20% thought it was a high contributor of FFR opportunity. On lack of Management reviews; 32% said it could highly create an opportunity for engaging in FFR, 60% thought it mostly contributed to FFR whereas 8% thought it could extremely contribute to FFR. On overriding of internal controls; 76% said it could extremely create an opportunity for engaging in FFR whereas 24% thought it was a high contributor of FFR opportunity. On lack of internal controls; 88% said it could extremely create an opportunity for engaging in FFR whereas 13% thought it was a high contributor of FFR opportunity. This therefore means that Lack of internal controls, Lack of competent personnel in oversight roles and overriding of existing controls were the highest contributors of FFR among listed firms as shown in Table 4.9 below.

Table 4.9 Internal control weaknesses linked with FFR

	<i>Seldom</i>	<i>Somewhat</i>	<i>Mostly</i>	<i>Very</i>	<i>Extremely</i>
Lack of Employee Fraud Education	0%	4%	16%	80%	0%
Lack of independent Checks/Audits	0%	0%	0%	32%	68%
Lack of competent personnel in oversight role	0%	0%	0%	20%	80%
Poor tone at the Top	0%	0%	0%	40%	60%
Lack of Management Review	0%	0%	32%	60%	8%
Lack of clear line of Authority	88%	12%	0%	0%	0%
Lack of reporting mechanism	29%	43%	0%	29%	0%
Override of existing internal controls	0%	0%	0%	24%	76%
Lack of Internal controls	0%	0%	0%	12%	88%

4.3 Diagnostic Tests

This section discusses the diagnostic tests performed prior to conducting Bivariate and Multivariate Analysis.

4.3.1 Test for Normality

To test for normality, the Kolmogorov-Smirnov and Shapiro-Wilk test were used in testing the alternative hypothesis that the data in consideration was non- normal. The alternative hypothesis was accepted where the significance level was less than 0.05 and was rejected if otherwise (Sekaran et al., 2010). As can be seen in table 4.10 below, both the Kolmogorov- Smirnov and Shapiro Wilk- test gave significant values of less than 0.05 for all variables under consideration thus leading to the acceptance of the alternative hypothesis of non-normality of data. An attempt to transform the variables did not improve the overall normality of the data set in question hence the decision to use all the study variables in their original form as was done by Zainudin & Hashim (2016). According to the central limit theorem, data with large sample size , greater than 30, have the tendency of being normally distribution regardless of the distribution of its population.

Table 4.10 Test for normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
PROF1	.149	332	.000	.931	332	.000
AC1	.080	332	.000	.953	332	.000
MQ1	.147	332	.000	.846	332	.000
AC2	.125	332	.000	.921	332	.000
PROF2	.396	332	.000	.272	332	.000
AC3	.224	332	.000	.775	332	.000
LIQ	.162	332	.000	.676	332	.000
EQ2	.359	332	.000	.227	332	.000
AC3	.113	332	.000	.904	332	.000

Note: PROF1- Cost of sales/Sales, PROF2- Related party sales/Total Sales, AC1- Inventory/Current Assets, AC2- PPE/Total Assets, AC3- Log of Total Assets, AC4- Receivables/Total Assets, EQ- Free cash flows/Cash flow from operating activities, MQ- Operating cost/Total Assets and LIQ- Working capital/Total Assets.

4.3.2 Test for Linearity

The aim of this test was to determine whether a linear relationship existed between the dependent and independent variable. For there to be linearity in any data set, a straight line pattern needs to be observed across incremental predictor values. Linearity is important when performing

multivariate analysis since its absence might lead to the underestimation of coefficient values in the regression. This study tested linearity using both scatter plots between dependent and independent variables and using Deviation from Linearity test.

Appendix II shows a straight line pattern in the scatter plot for the study variables hence depicting presence of linearity in the data set under consideration. Each independent variable was also assessed for linearity using the deviation from linearity test as depicted in appendix III. Linearity was to be affirmed if the significance value of Deviation from linearity was greater than 0.05. Findings in Appendix III reveal that 6 out of the 9 study variables retained for regression had significance value greater than 0.05 hence depicting presence of a linear relationship between the variables and FFR.

4.3.3 Test for Multicollinearity

Given the large number of variables under consideration, multicollinearity was expected. Multicollinearity arises in a study when independent variables become highly correlated among themselves. This study adopted the use of tolerance value and variance inflation factors as its yardstick for measuring multicollinearity. Generally, a tolerance value close to 1 and a VIF value less than 10 indicate lack of collinearity (Sekaran et al.,2010). To reduce the problem of multicollinearity, this study removed variables that had tolerance value greater than one and VIF value greater than 10. Table 4.11 below show the results of the set of variables with no multicollinearity.

Table 4.11 Test for Multicollinearity

	Collinearity Statistics	
	Tolerance	VIF
Inventory/Current Assets	.713	1.402
Operating cost/Total assets	.810	1.235
Related party Transaction	.956	1.047
Working Capital/Total Assets	.758	1.319
Free cash flows	.976	1.024
Operating Income/Total Assets	.920	1.087
Company Size	.895	1.117
Cost of Goods Sold/Sales	.660	1.515
Receivables/Total Assets	.681	1.468

a. Dependent Variable: FFR status

4.3.4 Test for Homoscedasticity

This test was used in determining whether a difference exists between residual variance of observations from one period to another. This study adopted the use of Test Glejser (Mathuva, 2016) in testing for the presence of homoscedasticity. This test rejected the hypothesis of no presence of homoscedasticity if the P-value was greater than 0.05 and otherwise. Given that the significance value was greater than 0.05, we concluded that there were no heteroscedasticity problem hence residual values in the regression showed homoscedasticity for the variables depicted in Table 4.12 below.

Table 4.12 Test for Homoscedasticity

	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
(Constant)	.217	.026		8.423	.000
Inventory/Current Assets	-.013	.053	-.013	-0.240	.810
Operating cost/Total assets	.059	.073	.046	0.810	.418
Related party Transaction	-.002	.006	-.015	-0.277	.782
Working Capital/Total Assets	-.016	.034	-.027	-.474	.636
Free cash flows	-.001	.001	-.061	-1.090	.277
Operating Income/Total Assets	.080	.066	.068	1.210	.227

a. Dependent Variable: AbsUt (residuals)

4.4 Selection of significant variables

Given the high number of variables that were initially considered for analysis, there was need to reduce the number and only be left with significant variables. Appendix IV shows the result of the stepwise regression- forward selection done on 43 variables. Variables with significance level of less than or equal to 0.10 were retained for further analysis. These variables included; free cash flows, change in cost of sales, change in provisions, cost of sales/sales, gross profit/sales, inventory/current assets, operating cost/total assets, operating income/sales, PPE/total assets, receivables/total assets, related party transactions, company size, total liability/total assets and working capital/total assets.

Table 4.13 shows the result of flagged correlation between sales, cost of sales and receivables. Unlike what conventional accounting dictates that there needs to be positive correlation between sales, cost of sales and receivables, 7 companies with code names were found to have had negative correlation between sales and cost of sales and negative correlation between sales and receivables. Companies with these deviations in financial relationship were categorized as having engaged in FFR. In addition to the above criteria, categorization of firms was also based on findings from the CMA annual reporting (2006-2017) on companies accused of having engaged in FFR. A total of 9 firms were selected as FFR firms out of the 37 firms under study. This represented 32.14% of listed firms as shown below and was in line with the PWC survey of 2004 which found 38% of respondents as having engaged in FFR (PWC, 2004).

Table 4.13: Correlation between Sales, Receivables & Cost of Sales for listed companies with deviations

			Change in Sales	Change in Receivables	Change in Cost of sales
Company A	Change in Sales	Pearson Correlation	1	.889(**)	-.922(**)
Company A	Change in Receivables	Pearson Correlation	.889(**)	1	-.774(**)
Company A	Change in Cost of sales	Pearson Correlation	-.922(**)	-.774(**)	1
Company B	Change in Sales	Pearson Correlation	1	-0.327	0.312
Company B	Change in Receivables	Pearson Correlation	-0.327	1	-0.301
Company B	Change in Cost of sales	Pearson Correlation	0.312	-0.301	1
Company C	Change in Sales	Pearson Correlation	1	-.997(**)	-0.093
Company C	Change in Receivables	Pearson Correlation	-.997(**)	1	0.088
Company C	Change in Cost of sales	Pearson Correlation	-0.093	0.088	1
Company D	Change in Sales	Pearson Correlation	1	-0.101	.931(**)
Company D	Change in Receivables	Pearson Correlation	-0.101	1	-0.152
Company D	Change in Cost of sales	Pearson Correlation	.931(**)	-0.152	1
Company E	Change in Sales	Pearson Correlation	1	-0.046	.940(**)
Company E	Change in Receivables	Pearson Correlation	-0.046	1	-0.231
Company E	Change in Cost of sales	Pearson Correlation	.940(**)	-0.231	1
Company F	Change in Sales	Pearson Correlation	1	-0.413	0.319
Company F	Change in Receivables	Pearson Correlation	-0.413	1	-0.569
Company F	Change in Cost of sales	Pearson Correlation	0.319	-0.569	1
Company G	Change in Sales	Pearson Correlation	1	.727(*)	-0.142
Company G	Change in Receivables	Pearson Correlation	.727(*)	1	-0.013
Company G	Change in Cost of sales	Pearson Correlation	-0.142	-0.013	1

Note: Company A-G represents code names for affected listed companies. (**) denotes significance at 0.05 level whereas (*) denotes significance at 0.10 level.

4.5 Correlation Analysis

Table 4.14 shows findings of correlation between predictor variables and the dependent variable as measured by Pearson's correlation. The results showed that there was correlation among all the study variables. Six variables were found to have had significant correlations with fraudulent financial reporting at 0.05. These variables included; free cash flows, cost of sales/sales, PPE/total assets, receivables/Total assets, related party transactions and working capital/Total Assets.

Table 4.14: Correlation Analysis on significant variables

Probability	FFR	FCF	COS_S	I_CA	OC_TA	PPE_TA	R_TA	RPT	SIZE
FCF	-0.158***								
COS_S	0.229***	0.219***							
I_CA	-0.062	0.238***	0.526***						
OC_TA	0.015	0.185***	0.021	0.271***					
PPE_TA	0.265***	-0.279***	-0.144***	-0.138**	-0.051				
R_TA	-0.199***	0.260***	0.310***	0.272***	0.334***	-0.361***			
RPT	0.129**	-0.105**	0.055	-0.054	-0.191***	0.04	0.015		
SIZE	-0.026	-0.240***	0.06	-0.134**	-0.254***	0.149***	-0.292***	0.188***	
WC_TA	-0.250***	0.188***	0.124**	0.066	0.037	-0.282***	0.527***	0.002	-0.391**

*** - significant at the 1% level, ** - significant at the 5% level, * - significant at the 10% level, I_CA - Inventory/Current Assets, PPE_TA-PPE/Total Assets, SIZE-Log of Total Assets, R_TA-Receivables/Total Assets, FCF- Free cash flows/Cash flow from operating activities, OC_TA-Operating cost/Total Assets and WC_TA-Working capital/Total Assets.

4.6 Stepwise Logistic Regression Analysis

Variables that were found to have been significant from the results of the forward selection method were retained as input variables to be used in stepwise logistic regression. The 15 significant variables were then regressed using stepwise Logistic regression analysis in order to ascertain the effects of the 15 retained variables on the likelihood of a company engaging in FFR. The choice of logistic regression was also informed by the fact that the dependent variable (FFR status) was dichotomous in form given there was either presence of FFR or non-presence of FFR. Results from Table 4.15 below shows that after 14 iterations, 9 variables were found to be significant. These variables included; free cash flows, cost of sales/sales, inventory/current assets, operating cost/total assets, PPE/total assets, receivables/total assets, related party transactions, company size and working capital/total assets. The above findings are in line with studies done by: Zainudin &

Hashim(2016) who found Working capital/Total assets, Inventory/Total assets, Current assets/total assets Revenue/Total assets and receivables/revenue as significant in detecting FFR. Spathis(2002) found; Working capital/Total assets, Inventory/sales, Receivables/sales, Total debt/total assets, gross profit/total assets and net profit/sales. Persons, 1995 found out size, Current assets/Total assets, Sales/Total assets and Total asset/Total liabilities as being significant in detecting fraud. Hasnan, Rahman, & Mahenthiran (2012), found Related party transactions and power governance as significant factors associated with FFR.

Table 4.15: Logistic regression analysis results on significant variables

Variable	Coefficient	Std. Error	z-Statistic	Prob.
<i>CFOOCFFI_CFFO</i>	-0.051**	0.022	-2.316	0.021
<i>CHNG_COS</i>	-0.198	0.376	-0.527	0.598
<i>CHNGPROVIS</i>	0.114	0.111	1.031	0.303
<i>COS_S</i>	9.833***	2.921	3.366	0.001
<i>GP_S</i>	2.408	2.762	0.872	0.383
<i>I_CA</i>	-5.277***	1.398	-3.773	0.000
<i>OC_TA</i>	5.364***	1.683	3.187	0.001
<i>OI_S</i>	0.754	0.876	0.861	0.389
<i>PPE_TA</i>	2.262**	1.091	2.073	0.038
<i>R_TA</i>	-9.469***	2.628	-3.604	0.000
<i>RPT</i>	0.486***	0.168	2.890	0.004
<i>SIZE</i>	-0.426***	0.136	-3.121	0.002
<i>TL_TA</i>	1.304	1.386	0.941	0.347
<i>WC_TA</i>	-2.891**	1.329	-2.175	0.030
<i>C</i>	353.058	179.782	1.964	0.050

Note; *** - significant at the 1% level, ** - significant at the 5% level, * - significant at the 10% level, McFadden R-squared = 0.579, p-value= 0.000, log likelihood= -72.622. Akaike info criteria=0.539 *CFOOCFFI_CFFO* denotes Free cash flows, *CHNG_COS* denotes change in cost of sales, *CHNGPROVIS* denotes change in provisions, *COS_S* denotes cost of sales/sales, *GP_S* denotes Gross profit/sales, *I_CA* denotes Inventory/Current Assets, *OC_TA* denotes operating cost/Total Assets, *OI_S* denotes Operating Income/Sales, *PPE_TA* denotes PPE/Total Assets, *R_TA* denotes Receivables/Total Assets, *RPT* denotes related party transactions, *TL_TA* denotes Total Liabilities/Total Assets, *WC_TA* denotes Working capital/Total assets.

The 9 variables found to have been significant at 0.05 and 0.01 were regressed further using logistic regression. Since all the 9 variables had p values less than 0.05, the hypothesis that there was significant differences between the mean of FFR firms from those of non FFR firms was accepted meaning that all 9 variables were significant in differentiating FFR firms from non FFR firms. Table 4.16 below shows the findings of the final regression.

Table 4.16: Final logistic regression model

Variable	Coefficient	Std. Error	z-Statistic	Prob.
PROF 1	8.092***	1.322	6.120	0.000
PROF2	0.496***	0.159	3.115	0.002
AC1	-5.317***	1.387	-3.832	0.000
AC2	2.596***	0.888	2.923	0.004
AC3	-9.028***	2.369	-3.811	0.000
AC4	-0.411***	0.134	-3.059	0.002
EQ	-0.056***	0.022	-2.606	0.009
MQ	5.586***	1.644	3.398	0.001
LIQ	-2.997**	1.319	-2.273	0.023
C	375.995**	174.042	2.160	0.031

*** - significant at the 1% level, ** - significant at the 5% level, * - significant at the 10% level, McFadden R-squared = 0.564, p-value= 0.001, log likelihood= -75,077. Akaike info criteria=0.525
PROF1-Cost of sales/Sales, PROF2-Related party transactions/Total sales, AC1 - Inventory/Current Assets, AC2-PPE/Total Assets, AC3-Log of Total Assets, AC4-Receivables/Total Assets, EQ- Free cash flows/Cash flow from operating activities, MQ- Operating cost/Total Assets, LIQ-Working capital/Total Assets and C- Constant.

N = 1 = Fraudulent financial reporting firm

N = 0 = Non Fraudulent financial reporting firm

The pseudo r-squared value of the model as measured by the McFadden R-squared stood at 0.564 depicted the model fit. This r-squared value is used as an analogy of the r-squared in least square regressions but does not necessary represent the proportion of variation of the dependent variable that is accounted for by the predictor variables. The p value of 0.001 meant that the full adopted model of the study exhibited evidence of a good model fit. The coefficient beta values indicated the predicted probability of group membership falling within the targets group. The coefficient also measured the predicted change in the log odds for every change in one unit of the predictor variable. Positive coefficient meant positive relationship between the predictor and the dependent variable and higher likelihood of firms being categorized as FFR group whereas a negative coefficient meant that at higher levels of the predictor, the likelihood of a firm falling under FFR were low. Coefficient value greater than 1 indicates greater likelihood of a firm being categorized as fraudulent and vice versa. PROF 1 was positively related to the likelihood of falling into FFR categories. Firms with higher levels of PROF 1 were more likely to fall under FFR category. AC1's negative coefficient indicated the probability of firms falling under non FFR firms.

4.7 Triangulation of primary and secondary results

This study adopted the use of both primary and secondary data in a bid to understand the usefulness of financial ratios in detecting fraudulent financial reporting. Secondary data in the form of published financial statements was used as the main source of data with primary data complimenting it. The main objective of secondary data was to answer objective 1 which sought to establish which ratios were significant in differentiating FFR firms from non FFR firms. To this end, the following ratios were found to be significant: profitability ratios (cost of sales and related party transactions), asset composition ratios (Inventory/current assets, PPE/total assets and receivables/total asset), earnings quality ratio (free cash flow ratio), management quality ratio (operating cost/total assets) and liquidity ratio (Working capital/Total assets). When respondents were asked to rate financial ratios in terms of their applicability and effectiveness in detecting FFR as used in their organization, changes in provisions received the highest rating at 21% followed by liquidity ratios at 19%, leverage ratios at 16%, cost of sales/sales at 12% and profitability ratios at 8%. As can be seen, there is convergence in terms of the significance of liquidity ratios, profitability ratios and cost of sales/sales both from results of the logistic regression and the views of industry players.

Findings on FFR management techniques adopted by firms tally with findings from the study's literature review given that both indicate external audit process as being the most adopted FFR management technique. As a matter of fact, findings from secondary data on changes of auditors revealed that most listed firms did not change their auditors between 2007 and 2016. As for techniques used by perpetrators in engaging in FFR, majority of the respondents rated creation of fraudulent transactions in the accounting system as the most used technique. This matches with findings from secondary data which suggested manipulation of reported balances in the accounting systems for account receivables, inventory and working capital as FFR red flags. Only 8% of the respondents stated that they used financial ratios as a detective tool against FFR. This tallies with the academic gap of the study's problems statements which indicated the need to use financial ratios in detecting FFR.

4.8 Chapter Summary

This chapter discussed findings from both secondary and primary data taking cognizance of the fact that secondary data was used as the main source of data whereas primary data was used to

corroborate findings from secondary data. The study begun by discussing the descriptive statistics on selected financial ratios as adopted in the conceptual framework. Thereafter, findings from questionnaires were discussed under; response rate, demographic characteristics and descriptive results. Under descriptive results, findings on specific research questions as highlighted in the questionnaires were discussed. Diagnostic tests were conducted on selected significant variables. These tests included; Normality test, Linearity test, Homoscedasticity test and multicollinearity test. Selection of significant variables was then done using the forward selection method. These significant variables were then regressed using stepwise logistic regression in order to determine the final set of variables considered to be significant in differentiating FFR firms from FFR firm.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter sought to provide a summary on the research findings and conclusions. The research findings were summarized as per the research objective outline in chapter one of the study. This chapter also provided recommendations and suggestions on areas for further studies on fraudulent financial reporting.

5.2 Summary of the Findings

This study adopted the use of stepwise logistic regression in analyzing financial ratios attributed to specific listed firms. Significant variables from the forward selection method of stepwise regression at alpha 0.10 were retained and thereafter adopted as inputs for the logistic regression model. A further test of correct classification revealed that 89.5% of original grouped cases (Fraudulent & Non-Fraudulent firms) were correctly classified. Overall, 9 variables were retained as significant in differentiating FFR firms from non FFR firms.

Findings from diagnostic tests revealed lack of normality on collected financial ratios. Diagnostic test also revealed lack of multicollinearity, lack of heteroscedasticity and presence of linearity in the data set. Findings further showed that the likelihood of approximately 32% of listed firms having engaged in FFR over the 10year period under consideration was high. In terms of ranking, the most affected sector was Commercial and Service sector with three firms being categorized as FFR followed by the Agricultural sector with 2 firms. The least affected industries on the other hand were telecommunications industry and Automobile industry both recording no firm under FFR.

5.2.1: Significant financial ratios used in differentiating FFR firms from non FFR firm

The first objective of this study was to determine ratios that were significant in differentiating FFR firms from non FFR firms. Overall, 9 ratios were found to be significant in differentiating FFR firms from non-FFR firms. These ratios included; Free cash flow ratios, cost of sales/sales, inventory/current Assets, operating cost/total Assets, working capital/total assets, related party transactions and company size. It was noted that the proportion of inventory and receivables in a firm's asset structure played a significant role in FFR. Findings from the logistic regression showed that firms with low inventory/total assets and low receivables/total assets were most likely to

engage in FFR than those with high inventory/total assets and high receivables/total assets given the significant negative correlation between the two variables and FFR. This was supported by the fact that the valuation of inventory and receivables is highly subjective in terms of estimations of due amounts and accounting for obsolete inventory (Persons, 1995). Loebbecke et al., (1989) found out that manipulation of account receivables and inventory accounted for 14% and 22% of all fraud cases in their study variable. Spathis (2002) also found out that manipulation of account receivables and inventory accounted for 75% of all SEC violation cases. Dalnial, et al., (2014) also found inventory/total assets significantly negatively correlated with FFR.

The proxy variables for profitability ratio which included Cost of sales and related party transaction brought to the fore the growing number of firms whose growth in sales did not match their respective growth in cost of sales. It was noted that FFR firms did not only have higher cost of sales/sales ratio when compared with non FFR firms but they also had their growth in sales not corresponding with growth in their cost of sales. High cost of sales translates into high financial pressure to improve profitability hence increasing the likelihood of FFR (Spathis, 2002). This was depicted by the significant positive correlation between FFR and cost of sales/sales. (Zainudin & Hashim, 2016)) also states that lower profitability increases the incentive for management to manipulate their financial performance.

Findings on related party transactions showed a positive correlation between related party transactions and FFR status. The practice of transfer pricing has beleaguered most related party transactions through inflation of prices and cost. FFR firms were reported to have had a higher related party transaction ratio as compared to non FFR firms. Hasnan & Rahma (2014) also found related party transactions to be positively correlated with FFR. Suyanto (2009), Young (2005) and Chen & Elder (2007) also found related party to be significant in providing incentives for FFR.

This study found a significant negative correlation between working capital/total assets ratio and FFR. It was noted that FFR firms had lower Working capital/Total Assets ratio when compared to non FFR firms. Given that this ratio was used as a proxy variable for liquidity ratio, firms with small working capital/total assets ratio had liquidity problems hence were more likely to engage in FFR than those with high liquidity ratios. Kreutzfeldt & Wallace (1996) and Omoye & Eragbhe (2014) also found out that firms with lower liquidity ratios were more likely to engage in FFR than

firms with higher liquidity ratios. Spathis (2002) and (Zainudin & Hashim, 2016) also found working capital/total assets ratio to be significant in detecting fraudulent.

Operating Cost/Total Assets measured what cost a firm incurred in operating its property/Assets. The study found FFR to be positively correlated with operating cost/total assets ratio. It was also noted that FFR firms had high operating expense ratios when compared to non-FFR firms. The higher the operating expense ratio the higher the incentive to engage in FFR in order to cover up for expected expenses. The study also found a significant negative correlation between free cash flows and FFR. FFR firms were found to have lower free cash flow ratio compared to non FFR firms. This ratio was used as a proxy variable for earnings quality and depicted the financial pressure that firms with low free cash flows undergo in order to finance their investment activities. Free cash flow was arrived at by finding the difference between cash flow from operating activities and cash flows from financing activities.

5.2.2: FFR management techniques adopted by listed firms

This study sought to determine FFR management techniques that had been adopted by listed firms when it came to detecting FFR. It was revealed from responses from distributed questionnaires, that majority of listed firms relied on only one stage of the fraud management lifecycle theory which was detection using external and internal audit as their preferred tool of managing FFR. Reliance on both internal and external audit processes accounted for 58% of all detective tools. The second most preferred tools after external and internal audit process was document examination at 10%. 8% of the respondents used ratio analysis in detecting FFR with only 3% having dedicated fraud departments responsible for conducting FFR investigations. Impromptu audits, training on FFR detections, hotlines and reward for whistle blowing were the least used FFR management techniques.

These findings are in support of the literature that most firms rely on external audit to manage FFR despite auditors not being responsible when it comes to detecting fraud. The small percentage of firms using ratio analysis also meant that this research will go a long way into helping listed firms in understanding the power of financial ratios in detecting fraudulent financial reporting.

5.3 Conclusions

This study used both primary and secondary data in line with theoretical and empirical literature on detection of fraudulent financial reporting using financial ratios. The initial list independent variable considered in this study included a list of 41 continuous variables and 2 dichotomous variables.

5.3.1: Significant financial ratios used in differentiating FFR firms from non FFR firm

The study found 9 variables to be significant in differentiating FFR firms from non FFR firms. These ratios included; Profitability ratios with cost of sales/sales and related party transactions as proxy variables; asset composition ratios with inventory/current assets, receivables/total assets, company size and PPE/total assets as proxy variable; earnings quality ratios with free cash flow as its proxy variable, liquidity ratios with working capital/total assets as proxy variable and management quality ratios with operating cost/total Assets as its proxy variable.

Findings from secondary data analysis suggested that FFR firms listed on the NSE tend to have: low profitability ratios, negative correlation between sales and cost of sales, negative correlation between sales and receivables, low liquidity ratios, low earning quality ratios and low management quality ratios.

5.3.2: FFR management techniques adopted by listed firms

The study found out that most listed firm relied on only one stage of the fraud management lifecycle theory, detection using external and internal audit, as their preferred technique for managing fraudulent financial reporting despite limitations of external auditor's responsibility when it comes to detecting fraud. Only a small percentage of listed firms used the remaining stages in the fraud management lifecycle theory in detecting FFR. This therefore underlined the significance of the study when it comes to understanding the power of financial ratios in detecting Fraudulent Financial Reporting.

Findings from primary data seem to suggest that firms which lack adequate internal controls against FFR, override their existing internal controls by not verifying/checking document before they get posted into financial systems, have frequent journal reversals and changes especially near closure of financial period, lack competent personnel in oversight roles, don't have regular FFR risk assessments and have a poor tone at the top when it comes to matters FFR, through inadequate managerial reviews and lack of Employee fraud training, were most likely to engage in FFR.

5.4 Recommendations

5.4.1: Significant financial ratio used in differentiating FFR firms from non FFR firm

Listed firms should consider using a set of more than one financial ratio in detecting FFR. A combination of ratios found to have been significant in this study will be helpful to auditors and management in effectively detecting and differentiating FFR firms from non FFR firms.

5.4.2: FFR management techniques adopted by listed firms

Listed firms should consider adopting all the eight stages of fraud management as discussed in the fraud management lifecycle theory. Having more than one FFR management tools will improve the effectiveness of managing risks associated with FFR. As has been highlighted in the research findings, both qualitative and quantitative financial information can be used in managing FFR thus listed firms should strive to adopt FFR detective tools that factors in the two.

Listed firms should also consider having frequent FFR risk assessment schedules and putting in place a dedicated section/office to deal with detecting and preventing fraudulent financial reporting. This will help in bridging the current gap that exists when it comes to risk assessment and detection skills against fraudulent financial reporting.

5.5 Contribution to Knowledge

This study added to the conceptual knowledge on the significance of using financial ratios in detecting FFR by establishing nine financial ratios which were found to be significant in differentiating listed FFR firms from listed non FFR firms in the NSE. In terms of methodological contribution, this study adopted the use of stepwise logistic regression and forward selection method in selecting significant variables from the initial list of 43 financial ratios. The study also broadened the scope of the target population from SACCOS in Kenya to companies listed on the NSE. Apart from determining financial ratios which were significant in differentiating FFR firms from Non FFR firms, this study also proposed the likely profile of a firm engaging in FFR. Finally, findings from this study will be helpful to both internal and external auditors when it comes to improving their efficiency and effectiveness in detecting FFR.

5.6 Suggestions for Further Research

In determining the usefulness of financial ratios in detecting FFR among companies listed on the NSE, this study did not include listed financial institutions and companies not listed on or before 2007. Future studies on this topic can expand the scope of their target sectors to include financial institutions and also institutions listed after 2007. Future studies can also expand the scope of study to factor other forms of fraud like asset misappropriation. Given that the study adopted stepwise logistic regression in selecting significant ratios, future studies on this topic can consider the use of discriminant analysis and Beneish model in selecting significant ratios that might differentiate FFR firms from Non FFR firms.

5.7 Limitations of the Study

Due to resource and time constraint, the scope of this study was restricted to 10 years, 2007 to 2016. This meant that FFR risk factors outside the period under considerations were not adopted into this study.

Given that most organizations tend to avoid disclosing fraud cases due to fear of brand damage, sampling of fraudulent and non-fraudulent firms strictly based on available public information from the CMA limited the scope of categorizing firms as fraudulent hence leading to the exclusion of listed companies accused of violations other than FFR.

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APPENDIX I: Questionnaires



21 May, 2018

TO WHOM IT MAY CONCERN

Academic Reference for Ongoro, Otieno Morgan No. 060055

Mr Ongoro Otieno Morgan is a postgraduate student in our Master of Commerce (MCom) programme. In partial fulfilment of the MCom degree, students are required to carry out a research project and write a thesis on a contemporary subject within their field of specialisation. Among other activities, the project involves data collection and analysis.

Ongoro is requesting to gather information to be used in his research. The information he will obtain from your organization will be used for this academic purpose only and will be kept confidential. The results of the survey will be in summary form and will not disclose any individual, company name or company information in any way.

The research study is entitled **“The use of financial information in detecting Fraudulent Financial Reporting.”**

We hope that your organization can assist by providing information to the above named student.

Yours faithfully,

Quindos Karanja
Coordinator – Master of Commerce
School of Management and Commerce
Email: qkaranja@strathmore.edu

My name is Morgan O. Ongoro a Master of Commerce- Forensic Accounting student at Strathmore University conducting a research on ***“The use of Financial ratios in detection Fraudulent Financial Reporting”***. At this point of my proposal I am concerned with collecting data from practitioners in Listed companies and Audit firms that should lead to insights and recommendations for other practitioners, investors and academicians on this subject. Your contribution will go a long way in achieving the objectives of the study. I would be grateful if you could spare some time to fill this questionnaire. I assure you that all information provided for this study will be treated with strict confidentiality and will be used for the sole purpose of this research. For any queries my contacts are; ongoromorgan@gmail.com or Otieno.morgan@strathmore.edu

Part A1: General Information

This section aims to collect general information about the respondent. This information will be used in classifying different responses and in identifying common patterns. Please tick where applicable.

1. Position held in the organization.

Chief Financial Officer	Management Accountant	Financial Accountant	Internal Auditor	External Auditor	Financial Analyst	Others

2. Years of experience in the particular position.

Between 1-5 years	Between 6-10 years	Between 11-15 years	Between 16-20 years	Above 20 years

Part A2

What is your company’s primary industry activity as specified in the Nairobi Securities Exchange classification?

.....

Part B1: Fraudulent Financial Reporting detection tools

The purpose of this section is to examine tools used by listed companies in detecting Fraudulent Financial Reporting. Please mark with an X or tick where appropriate.

Key: Least conversant =1, Less Conversant=2, Conversant=3, More Conversant=4, Very conversant=5

	1	2	3	4	5
--	---	---	---	---	---

How conversant are you with Fraudulent Financial Reporting detection tools?					
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B2; Please rate the following Fraudulent Financial Reporting detection method in order of applicability and effectiveness in your organization.

Key; Seldom=1, Somewhat=2, Mostly=3, Very=4, Extremely=5

	1	2	3	4	5
External Auditors					
Internal Audit departments					
Management Reviews					
Independent Audit Committee					
Hotline					
Employee support programs					
Fraud Training for Manager and Employees					
Anti-Fraud Policy					
Impromptu Audits					
Job Rotation					
Document Examination					
Formal Fraud Risk Assessment					
Dedicated Fraud department					
IT control					
Notification by Law Enforcement					
Rewards for Whistleblowers					
Ratio Analysis					
Others					

B3; This subsection looks at the frequency of using ratio analysis in detecting Fraudulent Financial Reporting. Please mark with an X or tick where appropriate.

Key; Never=1, Rarely=2, Occasionally=3, Frequently=4, Always=5

	1	2	3	4	5
--	---	---	---	---	---

How often do you use Ratio Analysis in detecting Fraudulent Financial Reporting?					
--	--	--	--	--	--

B4: Please rate the following financial ratios in terms of their effectiveness in detecting Fraudulent Financial Reporting. Mark with an X or tick where appropriate.

Key: Least Effective=1, Less Effective=2, Effective=3, More Effective=4, Very Effective=5

	1	2	3	4	5
Profitability Ratios					
Leverage ratios					
Liquidity Ratios					
Change in Receivables/Change in Revenue					
Change in Inventory/Change in sales					
Change in Sales/ Change in Cost of Sales					
Return on Asset					
Return on Equity					
Percentage change in Provisions					
Capital Adequacy Ratios					
Others					

Part C1; This subsection looks at Fraudulent Financial Reporting risk assessment and management attitude. Please mark with an X or tick where appropriate.

Key; Never=1, Rarely=2, Occasionally=3, Frequently=4, Always=5

	1	2	3	4	5
Does your company have regular schedules and formal procedures to perform Fraudulent Financial Reporting risk assessments?					
Does the Fraudulent Financial Reporting risk assessment include consideration of internal and external risk factors?					
Does management assess the design and operational effectiveness of the fraudulent financial reporting risk assessments?					

Does the Internal Audit function have sufficient involvement in anti-fraudulent financial reporting programs and controls					
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C2; The purpose of this section is to investigate the nature of Fraudulent Financial Reporting. Please mark with an X or tick where appropriate

D1; In your practice, how would you rate the likelihood of FFR perpetrators adopting the following fraud concealment schemes?

Key; Seldom=1, Somewhat=2, Mostly=3, Very=4, Extremely=5

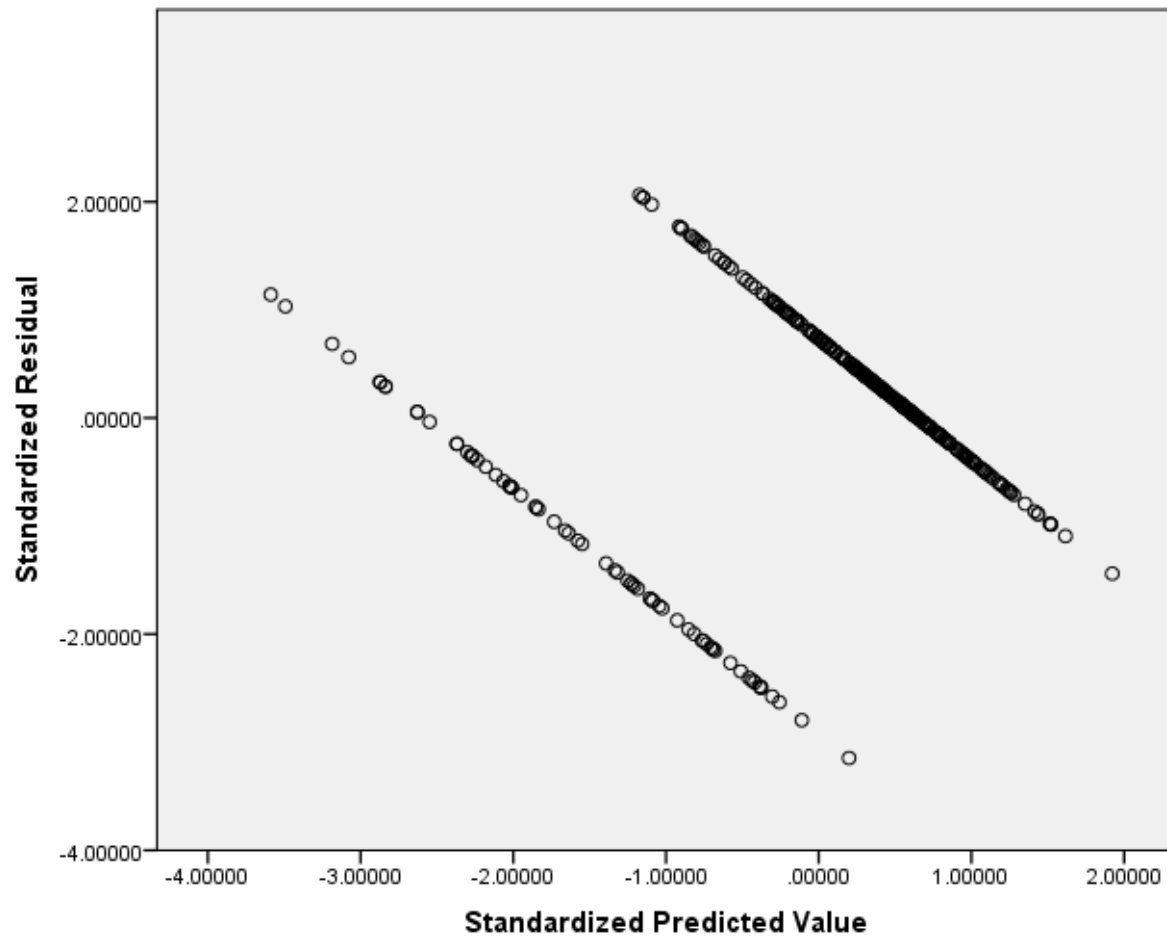
	1	2	3	4	5
Creating Fraudulent Physical Document					
Altering Transactions in the accounting System					
Altering Physical documents					
Creating Fraudulent Transactions in the accounting systems					

D2: Please rate the following internal control weakness that may contribute to Fraudulent Financial Reporting?

Key; Seldom=1, Somewhat=2, Mostly=3, Very=4, Extremely=5

	1	2	3	4	5
Lack of Employee Fraud Education					
Lack of independent Checks/Audits					
Lack of competent personnel in oversight role					
Poor tone at the Top					
Lack of Management Review					
Lack of clear line of Authority					
Lack of reporting mechanism					
Override of existing internal controls					
Lack of Internal controls					

APPENDIX II: Scatterplot on financial ratios variables



APPENDIX III: Linearity Test Using Deviation from Linearity

		Sum of Squares	df	Mean Square	F	Sig.
Cost of Goods Sold/Sales	Deviation from Linearity	37.074	242	.153	1.011	.486
Operating cost/Total assets	Deviation from Linearity	37.743	218	.173	1.087	.313
PPE/Total Assets	Deviation from Linearity	41.024	256	.160	1.138	.258
Company Size	Deviation from Linearity	44.966	273	.165	.872	.763
Related party Transaction	Deviation from Linearity	20.265	120	.169	1.127	.226
Inventory/Current Assets	Deviation from Linearity	46.976	253	.186	1.682	.004
Receivables/Total Assets	Deviation from Linearity	40.592	223	.182	1.524	.007
Free cash flows	Deviation from Linearity	53.759	306	.176	2.530	.004
Working Capital/Total Assets	Deviation from Linearity	45.547	263	.173	1.547	.017

Note; Significance level greater than 0.05 depict linearity of data

APPENDIX IV: Stepwise regression result

Variable	Coefficien t	Std. Error	t-Statistic	Prob.
CA_CL	0.008	0.021	0.406	0.685
CA_TA	-0.102	0.236	-0.432	0.666
CFOOCFFI_CFFO	-0.004	0.002	-1.732	0.084
CHNG_COS	-0.002	0.001	-1.784	0.076
CHNG_RECEIV	-0.005	0.023	-0.229	0.819
CHNG_SALES	0.007	0.030	0.229	0.819
CHNGAUDITOR	0.054	0.066	0.826	0.409
CHNGPROVIS	0.014	0.008	1.666	0.097
COMP_CODE	-0.012	0.003	-3.459	0.001
COMPLEXTRANS	-0.276	0.185	-1.492	0.137
COS_I	0.000	0.000	-0.802	0.423
COS_S	1.060	0.153	6.929	0.000
DATEID	0.000	0.000	-1.784	0.076
FA_TA	-0.165	0.130	-1.269	0.206
GP_A	-0.258	0.234	-1.102	0.272
GP_COS	0.000	0.001	-0.459	0.647
GP_S	0.327	0.195	1.678	0.095
I_CA	-0.586	0.197	-2.965	0.003
I_TA	0.127	0.380	0.334	0.739
INDCODE	-0.001	0.014	-0.074	0.941
NI_E	0.059	0.098	0.602	0.548
NI_TA	-0.025	0.430	-0.058	0.954
NICFFO_NI	0.002	0.004	0.521	0.603
NP_S	-0.050	0.112	-0.445	0.657
OC_S	0.049	0.152	0.325	0.746
OC_TA	0.503	0.207	2.437	0.015
OI_S	0.258	0.156	1.648	0.101
OI_TA	-0.110	0.231	-0.476	0.634
PPE_TA	0.330	0.100	3.291	0.001
QRATIO	-0.005	0.024	-0.187	0.852
R_TA	-0.728	0.257	-2.828	0.005
RE_TA	-0.031	0.137	-0.226	0.821
RESTATE	0.035	0.063	0.563	0.574
REV_OI	-0.041	0.036	-1.117	0.265
RPT	0.035	0.009	3.698	0.000
S_RECEIV	0.001	0.004	0.176	0.860
S_TA	-0.078	0.084	-0.921	0.358
SIZE	-0.046	0.012	-4.009	0.000
TC_TI	0.003	0.005	0.624	0.533
TD_TE	0.014	0.026	0.536	0.592
TE_TA	-0.055	0.136	-0.403	0.687
TE_TL	-0.011	0.024	-0.440	0.660
TI_TA	0.024	0.066	0.368	0.713
TL_TA	0.235	0.122	1.917	0.056
WC_TA	-0.175	0.085	-2.075	0.039
ZSCORE	0.022	0.040	0.556	0.578
C	23.426	13.094	1.789	0.075

APPENDIX V: List of Companies listed on the NSE

SECURITIES	TRADING SYMBOL	TOTAL NUMBER OF ISSUED SHARES
Kakuzi Ltd	KUKZ	19,599,999
Kapchorua Tea Co. Ltd	KAPC	7,824,000
The Limuru Tea Co. Ltd	LIMT	1,800,000
Williamson Tea Kenya Ltd	WTK	17,512,640
Car & General (K) Ltd	C&G	40,103,308
Marshalls (E.A.) Ltd	MASH	14,393,106
Express Kenya Ltd	XPRS	35,403,790
Kenya Airways Ltd	KQ	1,496,469,035
Longhorn Publishers Ltd	LKL	369,940,476
Nation Media Group Ltd	NMG	188,542,286
Standard Group Ltd	SGL	81,731,808
TPS Eastern Africa Ltd	TPSE	182,174,108
Uchumi Supermarket Ltd	UCHM	364,959,616
WPP Scangroup Ltd	SCAN	378,865,102
ARM Cement Ltd	ARM	495,275,000
Bamburi Cement Ltd	BAMB	362,959,275
Crown Paints Kenya Ltd	BERG	71,181,000
E.A.Cables Ltd	CABL	253,125,000
E.A.Portland Cement Co. Ltd	PORT	90,000,000
KenGen Co. Ltd	KEGN	6,243,873,779
KenolKobil Ltd	KENO	1,471,761,200
Kenya Power & Lighting Co Ltd	KPLC	1,953,617,045
Total Kenya Ltd	TOTL	175,028,706

SECURITIES	TRADING SYMBOL	TOTAL NUMBER OF ISSUED SHARES
Umeme Ltd	UMME	1,623,878,005
Britam Holdings Ltd	BRIT	1,938,415,838
Centum Investment Co Ltd	ICDC	665,441,775
Home Afrika Ltd	HAFR	405,255,320
Kurwitu Ventures Ltd	KURV	102,272
Olympia Capital Holdings Ltd	OCH	40,000,000
Trans-Century Ltd	TCL	281,426,593
Nairobi Securities Exchange Ltd Ord 4.00	NSE	259,500,000
B.O.C Kenya Ltd	BOC	19,525,446
British American Tobacco Kenya Ltd	BAT	100,000,000
Carbacid Investments Ltd	CARB	254,851,988
East African Breweries Ltd	EABL	790,774,356
Eveready East Africa Ltd	EVRD	210,000,000
Mumias Sugar Co. Ltd	MSC	1,530,000,000
Unga Group Ltd	UNGA	75,708,873
Safaricom Ltd	SCOM	40,065,428,000
STANLIB FAHARI I-REIT. Ord.20.00	FAHR	180,972,300

Source (<https://www.nse.co.ke/listed-companies/list.html>)